23 MARCH 1950

ONE SHILLING

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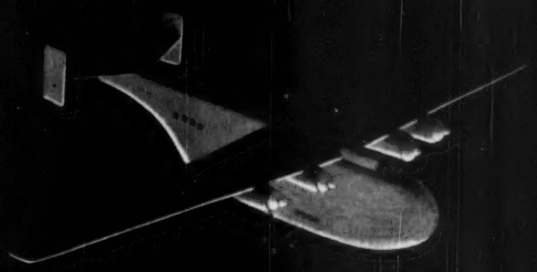

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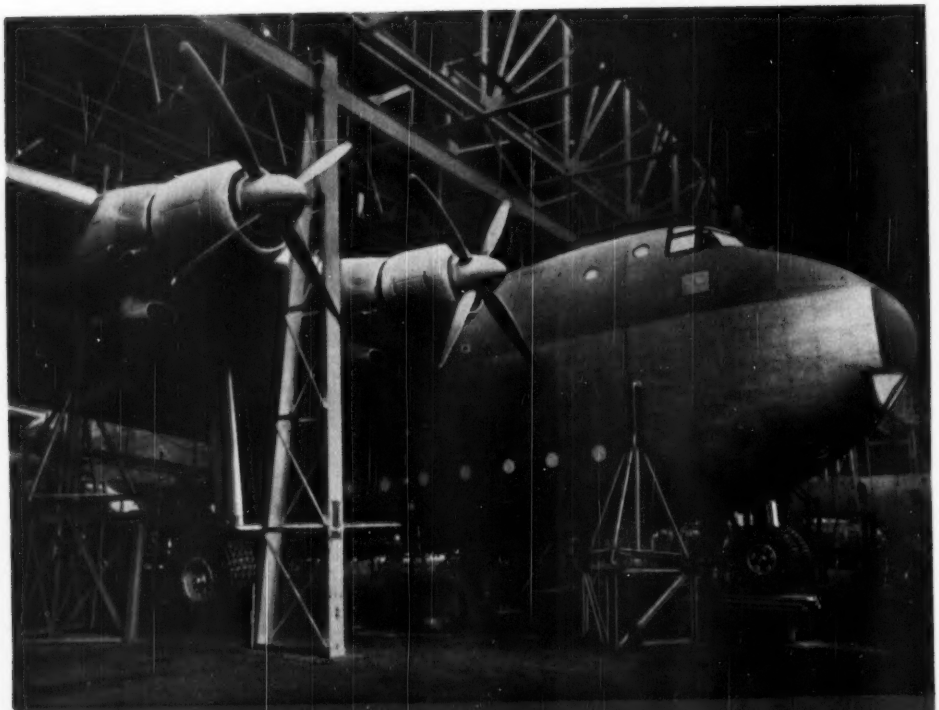

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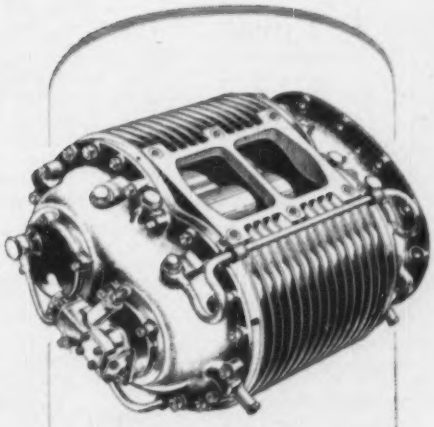

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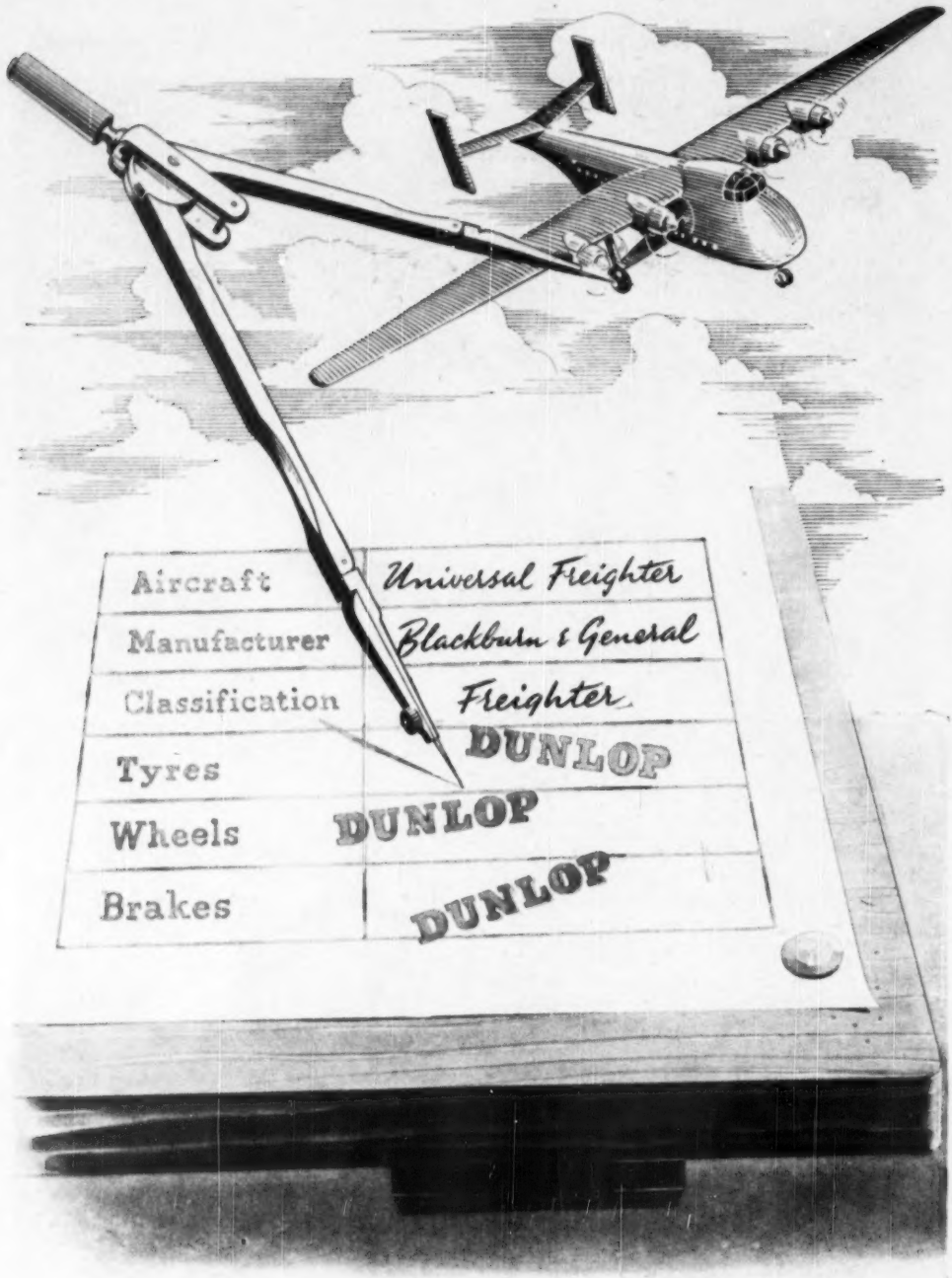

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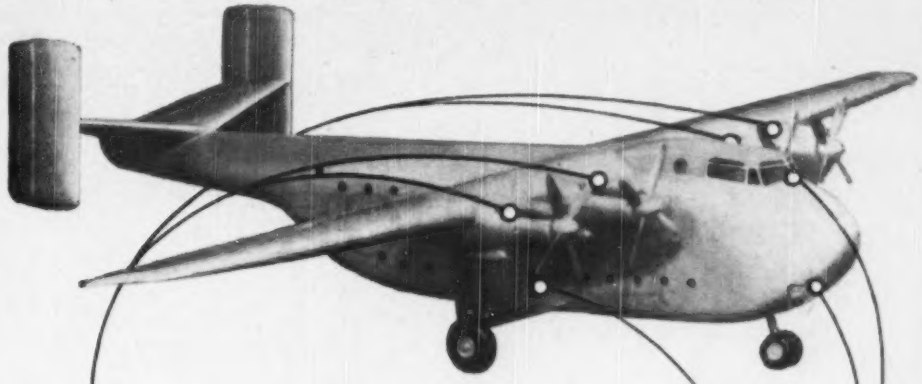

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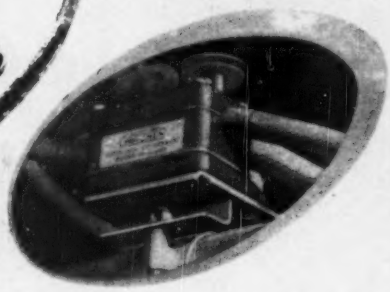

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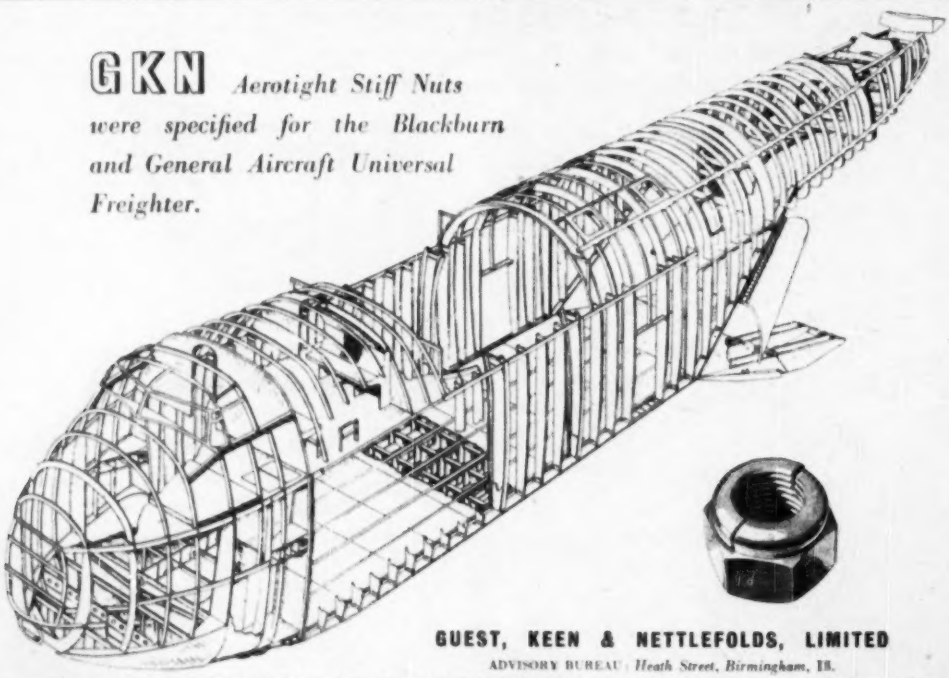

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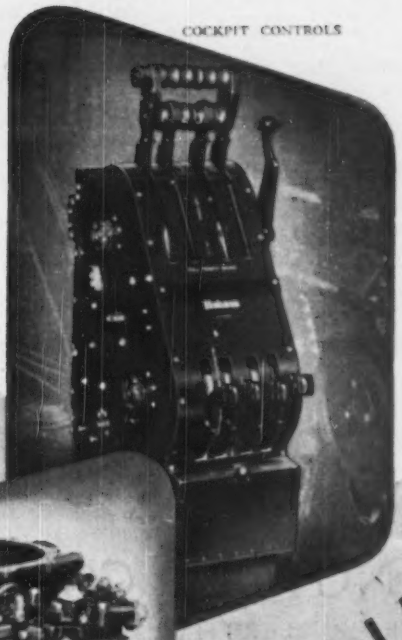

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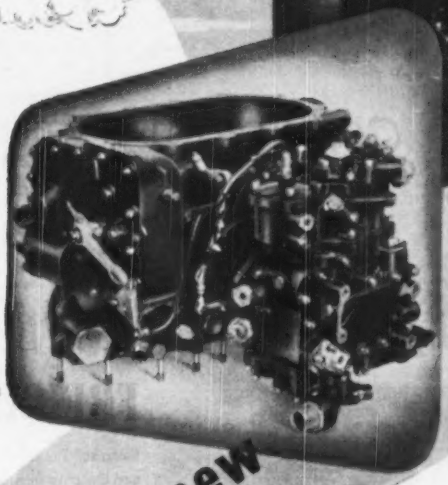

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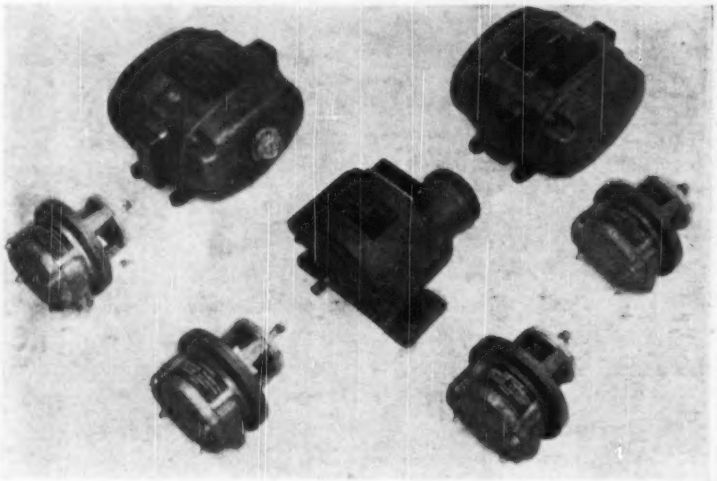

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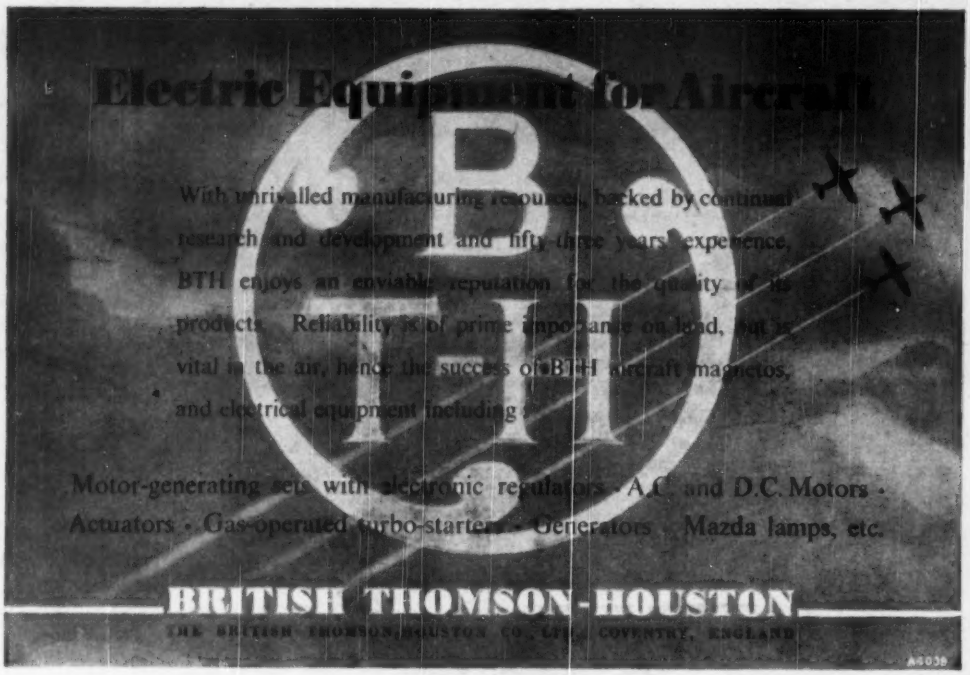
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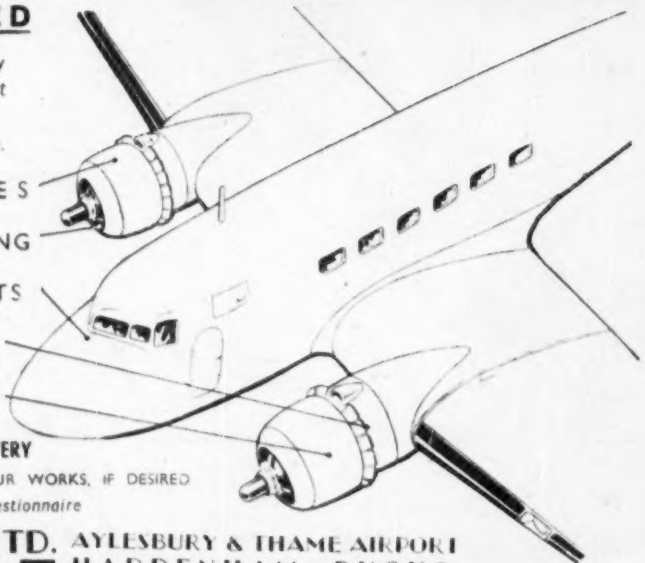

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Founded 1909

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The Fighter's Fangs

IT has always seemed to this journal quite illogical that, though the performance of fighter aircraft generally advances by major increments over a period of years, armament does not develop commensurately. The 1917 Camel and the Gauntlet of 1934, for instance, were similarly equipped with twin rifle-bore Vickers guns (though the Gauntlet, admittedly, commanded a somewhat higher rate of fire), and the Battle of Britain had been fought and won before our fighters began to receive cannon armament—long since common in Europe—on any appreciable scale. By 1941 it is true, the Hurricane IIC was available with its four 20-mm cannon, but that same "4 × 20mm" formula has now persisted for nearly ten years, though fighter speed has been nearly doubled and the problems of air combat have become vastly more complex. Somehow, the aircraft gun has come to be regarded in the same way as the infantryman's rifle; new fighters, like soldiers, come and go, but the contents of the armoury remain. To put it bluntly, the R.A.F. now finds itself with admirable fighters which lack armament compatible with their performance. The possibility must be faced that, in the event of a conflict in the immediate future, our Meteors and Vampires might have to be sent against massed formations of heavily turreted bombers, or swift, marauding jets, with no more fire power at their command than had the Hurricane of 1941.

We should be the last to advocate publicity for new armament while there was the slightest possibility that it remained secret from a potential foe, but if and when new heavier-calibre guns are standardized, consideration should be given to an official statement. Only by this means can the anxiety, which unquestionably exists among those who have this country's defences at heart, be allayed.

The gun, however, is by no means the only weapon required. An immediate need is apparent for rocket projectiles suitable for dispersing bomber formations, not to mention far more elaborate air-launched, guided or homing missiles—as already publicized in America—capable of "killing" at long range in bad weather.

Capital Salesmanship

ONCE again interest is focused upon the activities of two outstanding British civil aircraft, the Comet and Viscount gas-turbine-powered airliners, for both have been and are even now engaged in enhancing their own and this country's reputation abroad. The Viscount is at present making a tour of demonstration in Europe, while the Comet has recently visited Rome and Copenhagen. A narrative of the Comet's remarkable record flights to Rome and back, all within a few minutes of four hours' flying time, is a feature of this issue.

There are those who, perhaps with some justification, frown upon record attempts as being wasteful and risky and of doubtful value. We have always believed that records which bear witness to definite, worth-while achievement are themselves worth-while both technically and from the prestige and publicity points of view. When, however, an aircraft represents such a marked technical advance over its contemporaries that records are well within its capabilities on a normal development flight to check fuel consumption, no one could seriously object to the arrangement of the few formalities necessary to observe and confirm such an achievement. As we go to press, plans are in hand for other capital-to-capital and return record attempts by the Comet, on one of which it will carry members of the Press to Copenhagen. These notable flights, incidentally, are now facilitated by the issue of a special provisional C. of A., which allows the Comet to go abroad without prior permission.

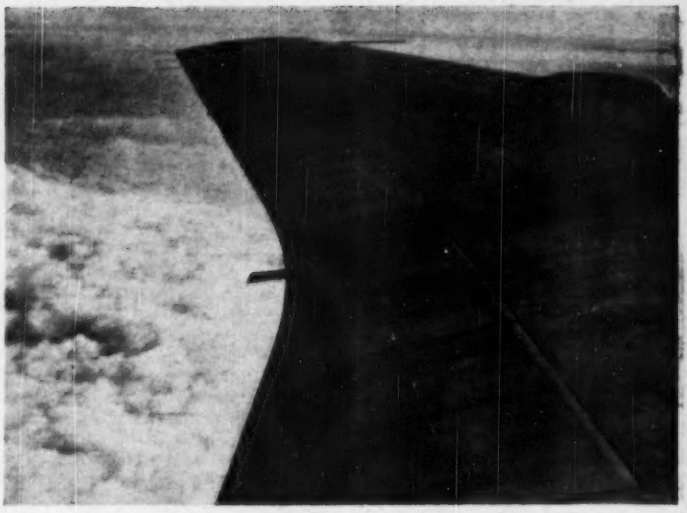
The versatility of this pure-jet aircraft, now becoming apparent, will not escape the attention of discerning operators. Those at home who have been privileged to fly in the Comet and the turboprop Viscount have without exception been greatly impressed by the unique qualities of smooth and silent speed shared by the two airliners. These characteristics cannot fail to impress those on the Continent who experience them during the next few weeks.

ROME—IN A DAY

There and Back in Four Hours' Flying Time: First-Hand Impressions of the Comet's Record Trip

By the Editor

Illustrated with "Flight" photographs



The time is rapidly drawing closer when passengers on the world's airlines will be familiar with the Comet's characteristic wing form, here seen with its boundary-layer fence—probably a standard fitting.

RECORD flights are usually attended by feverish last-minute trials and preparations, by fuss and flap, by doubts, hopes and fears, and often by a great deal of physical exertion as well. That these were entirely absent on the occasion of the de Havilland Comet's flights to and from Rome was no cause for disappointment among the fortunate few who participated—nor, in fact, had anything of the sort been expected. The whole business last Thursday, March 16th, was entirely in keeping with the atmosphere of dignified confidence which surrounds the Comet and its capabilities as demonstrated to date. It is quite remarkable how everyone in this country has so soon come to accept the Comet and already to expect from it a performance which in any other civil aircraft would be regarded as astounding.

The chief test pilot, John Cunningham, has a way of saying a word or two on landing which gives a clearer picture of a flight than would a thousand-word report. On returning to Hatfield on this occasion he said: "An uneventful trip—no troubles, no worries." Truly, it might have been a routine passenger service to and from Ciampino airport at Rome. And in this its importance lies, for it was in the nature of an early proving flight, sixteen privileged passengers being carried. Quite soon B.O.A.C. will, it is hoped, be introducing the Comets into passenger service over Middle East routes; possibly this very stage may be flown. Above all else, airlines must be able to offer safe, reliable, uneventful journeys. The Comet has demonstrated once more that it can fulfil this requirement and offer as well exceptional speed, better-than-average comfort, and economy for the operator. The capturing of records by an airliner under development is quite incidental to its serious trials—though no less creditable to the aircraft and its manufacturers for that reason.

Many records are within the capacity of the Comet, and on the Rome flight, for example, records for 1,000 or 2,000 kg load for 1,000 km and the same loads to 10,000 metres altitude might well have been brought in. Previously the London-to-Rome record was held by S/L. Neville Duke (Hawker Fury), who took 2 hr 31 min 51 sec. The Comet's out and return times (Hatfield-Ciampino) were 2 hr 2 min 52 sec and 2 hr 4 min 14 sec. These figures are subject to confirmation and, with others (see page 384) will in due course be homologated for record status.

Diary and Impressions of the Flights

By my watch, the wheels left the long Hatfield runway at 09.15 hr 20 sec. We passengers shared the cabin space with recording equipment and test gear, but the dozen or so temporary seats provided all the comfort we needed. Through the door in the forward bulkhead we could see more instruments, the foremost water-ballast tank (c.g. is altered for tests by transferring water between front and rear tanks) and, ahead of this, three of the crew of five at their stations. The cabin is pressurized, but the whole conditioning system is quite newly installed and is still under development. There is little trimming, carpeting or furnishing as yet, and for this reason we could not judge how low the noise level will be in service.

Quite a crowd had gathered to give us a send-off, and after clearing Customs at the airfield we had climbed in at the starboard-side front door. Weather and visibility were good, but rather adverse

Temporary comfort for privileged passengers: Air Marshal Coryton, Controller of Supplies (Air), M.o.S., is talking to Major Mullock in the part-furnished Comet cabin. Very different standards of comfort will be offered to B.O.A.C. passengers.

Mr. John Cunningham, chief test pilot of the de Havilland Aircraft Co., Ltd., at the controls of the famous prototype.

winds had been forecast for part of the journey.

It was possible to feel that the Ghosts were being started up, but, unless one looked behind the jet-pipes from the rear pair of windows one could not tell how many were running or on which side. With the power units idling on the tarmac, the high whine of the compressors could be heard quite clearly in the front seats, while in the rear seats a distant, muffled roaring or rushing sound could be heard from the jet-pipes. I could not detect any vibration even over the main spar, but in the tail a certain amount could be detected by pressing one's forehead against some part of the structure. I am told that this is probably the effect of the efflux on the rear fuselage rather than of mechanical influence transmitted through centre section and fuselage structure.

Within three minutes of take-off the outside altimeter indicated 4,700ft. The Comet climbed smoothly through patches of stratus, and over the Thames east of the city 11,000ft had been reached 7½ minutes after take-off.

From the time the pilot opened up the four Ghosts against the brakes at the end of the runway until operational altitude was reached, I noted the noise carefully, not forgetting that the cabin was practically unfurnished. On take-off the jet roar was pronounced, the volume of sound being almost the same as in, for example, a Skymaster. The steady note was less irritating than that produced by piston-engine exhausts and airscrews and, as would be expected, decreased in intensity as one walked towards the nose. Being of very high frequency, the compressor whine was less audible in the cabin when the Ghosts were running at high r.p.m. than when they were idling. On the climb the sounds seem to become more remote with each 1,000ft of altitude and cruising at over 30,000ft the noise level is better than on any contemporary aircraft I have tried except the Viscount which is almost silent. Behind the jet-pipe line is, of course, the noisiest part of the cabin, but even there the powerful rushing noise is nothing to remark upon. The smoothness is impressive and for even the slightest vibration one must search well back in the tail. Normal trimmings and carpets will insulate it completely.

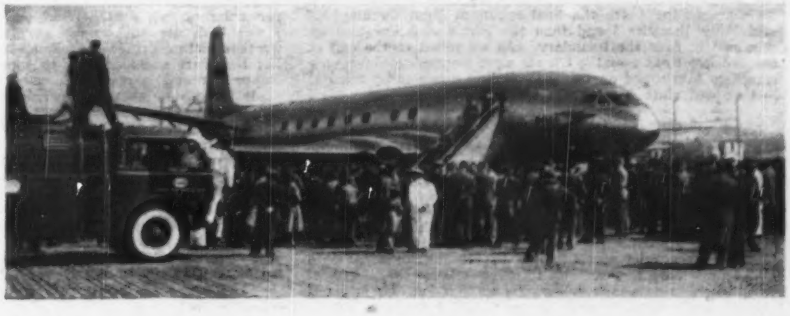
At 09.30, fifteen minutes after take-off, we were over the east shore of Dungeness at 21,500ft and with a cabin-altitude reading of about 4,500ft. The coastline was clear, but we soon entered sparkling layer-cloud at 24,000ft and felt a slight bouncing—little more than a tremble.

By 09.34 we were in clear, bright blue sky at 26,000ft (cabin 8,000ft) with a full cover of medium-height st-cu hiding sea and land below. There was little impression of height or speed and flying was liquid in its smoothness. I was surprised by the brightness and spaciousness of the cabin, with it cream roof, grey walls and floor and blue temporary seats. The almost square, low-set windows appear large from inside the cabin, and they give a good look-out to both outside and aisle passengers.

Thirty-thousand feet was reached at 09.38 hr (cabin 10,400ft), when the distance covered was just over 100 nautical miles. All was quiet and smooth except for a very occasional small bounce. We chatted over a glass of sherry in warmth and comfort.

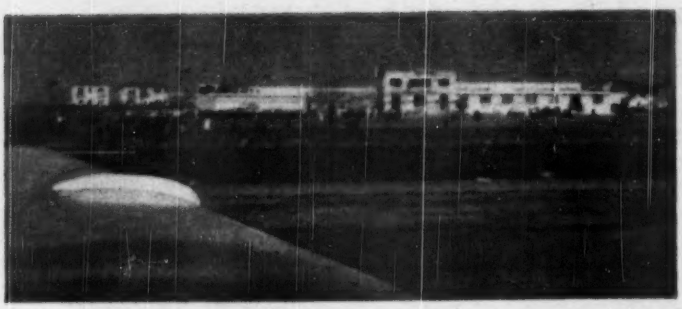
At 10.00 hr I walked up to the cockpit and looked over the dials. The course was 163 deg M; altitude was 31,150ft; indicated speed 273 kt and, on another instrument, 350 m.p.h.; Ghost r.p.m. 9,480; jet-pipe temperature 560 deg C; outside air temperature, −26 deg C ind.; Mach reading 0.72.

It may be remarked here that for reasons of passenger comfort with the cabin pressurization as at present, we flew some 6,000 to 8,000ft below the most economical level. Again, because it was the wish to reach Rome in two hours or less, in spite of rather adverse winds (and because plenty of extra fuel was available) neither cruising nor let-down were at all times carried out in the most economical manner. Consumption per Ghost was probably some 25 gal/hr above average on the journey. Total consumption on the outward journey was in the region of 900 gallons. This the Esso Company replaced at Ciampino, supplying, incidentally, the first aviation kerosene to British specification to come from their Trieste refinery. A sample of the 4,000 gallons had been made available and tested and approved in England a week earlier.



An enthusiastic welcome was accorded to Britain's jet airliner on arrival at Ciampino airport, near Rome. Only 2 hours 2 minutes had elapsed since take-off from Hatfield.

ROME—IN A DAY...



A last glimpse through the Comet's cabin windows of Ciampino Airport's new and under-construction buildings as the aircraft accelerates down the long runway. The new tarmac runway is alongside a wartime P.S.P. runway.

A deeper blue sky lay overhead when, at 10.30, we had one fleeting glimpse of snow-covered mountain peaks through a rift in the cloud blanket some 16,000ft below. To the south-east, at our level, there was a bank of wispy cloud in which we could almost see the ice crystals.

Twelve minutes later, at 10.42—less than 1¼ hours after our take-off—the River Po could be seen below, with Pavia nearby. Cloud was conveniently breaking up for our descent, and we could see something of the mountains, lakes and Mediterranean coastline nearly 32,000ft below.

The next recognizable point visible through cloud-breaks was near Pisa, though not the town itself. This was a minute before 11.00, when we first started to lose height. Already a B.E.A. machine had been heard "working" Rome, and weather was reported good. Readings on the pilot's instruments at this time were 300 kt I.A.S., M=0.77, 29,500ft, 9,520 r.p.m., jet-pipe temperature, 595 deg C.

The descent proper began at 11.07 hr. Cloud was less than ⅛th, far below, and there was a suggestion of heat haze. A great backbone of dark-brown peaks could be seen to port and ahead, while on the starboard side stretched the coast-line. The navigator estimated our T.A.S. during the last 15 minutes before descent to have been 422 kt. Instrument readings were now 27,500ft; 308 kt I.A.S.; −15 deg C outside temperature; M=0.765. Rome was not yet visible, but I remarked to John Cunningham upon the good view the pilot has through the deep, fairly narrow, screen panels. Ahead, he agreed, was excellent; obliquely through each other's panels, the pilots see well, but with a little distortion. The nose of the Comet slopes away from the screen and cannot be seen. Only the tips of the two pitots, like prongs on the long arm extending from the nose cap, are visible ahead.

Turbines were now closed down a little at a time, inboards first—8,500 r.p.m., 8,000, 7,000, and finally right back to 4,000 r.p.m. Outboards, in the meantime, were set at 9,000, later at 8,000, and finally at 7,700 r.p.m. For a short time the Machmeter read 0.785 and as Rome came nearer we descended more steeply. When the airfield was seen and identified, rate of descent was at times around 4,000 ft/min, and to keep the speed down all four Ghosts were shut down to 4,000 r.p.m. At 5,000ft we bounced through a few puffs of cloud, and at 11.17 hr made an impressive low swoop over the field at 340 kt.

Large crowds of people awaited the Comet on the tarmac and knots of mechanics and labourers gathered on the airfield and fringing roads and fields to gaze at it. A wide, low right-hand circuit brought us in line with the newly finished tarmac runway for John Cunningham to ease the airliner, tail low, smoothly on to its main wheels. On the circuit I listened on the crew intercom and heard the second pilot talking the captain round when he lost sight of the airfield due to the right-hand direction. In the cabin we could, for the first time, enjoy for a moment the fascinating scenery—ruined buildings from the time of the Cæsars, ancient aqueducts and the tiny, colourful clustering villages on the hillsides and in the flat country nearer to the sea. As speed dropped off, "7,000 r.p.m. all round" was called for, then "wheels" and "air brakes in." On the final approach John Cunningham said "my throttles" and then the whine died low and we skimmed in over the boundary. As we rolled to the end of the runway Nos. 2 and 3 Ghosts were stopped, and we continued to taxi round on 1 and 4. Only 2 hours and 7 minutes had elapsed since leaving the Hatfield runway.

In Rome

After an enthusiastic and friendly reception at Ciampino airfield cars were brought round and we were taken to an official luncheon at the imposing Italian Air Force Club. Here we were honoured by the presence of Sir Victor A. L. Mallett, British Ambassador, the British air, naval and military attachés, and several high-ranking officers in addition to Signor Malintoppi, Italian under-secretary of state for air. Interpreter for the brief speeches was the Italian air attaché in London, Colonel Fanali, who recently led the first flight of Italian Vampires on their delivery by air to Milan. He returned with us in the Comet. Signor Malintoppi said that he welcomed "friends from England and especially those of the de Havilland Enterprise who permit us to admire the Comet to-day using Italian skies." A new era in aviation was heralded. He thanked de Havillands, also, for their hospitality to Italian pilots in England. Great credit was due to that company for both its civil and military development.

Sir Victor Mallett, in reply, said that he was most grateful for the arrangement of such a wonderful reception at such short notice, and much touched by the presence of the minister of defence and distinguished generals to witness the visit of our latest achievement. We were very proud of the Comet and of some of our military aircraft now in production. The English were not given to boasting, but Italians had shown their faith in our aircraft by ordering Vampires. Sir Victor was sure they would be pleased with them, and he was delighted that the first Vampires had now arrived in Italy. He hoped it would be the beginning of many other orders, and extended best wishes to Italian aviation.

Mr. F. E. N. St. Barbe, sales director of the de Havilland Aircraft Co., Ltd., said that he appreciated the wonderful reception and hospitality. "To-day's flight," he said, "is an indication of what is to become a normal thing." It was only a pity that passports had been needed. He hoped that today's associations would be the start of beneficial agreements for both countries.

Considerately, speeches and luncheon were completed as quickly as possible so that in the remaining hour before take-off we could drive slowly back to the airfield and see some of the wonders of Rome's architecture. Shops were all closed until 4 p.m., although one or two enterprising street sellers quoted "one and seex" for chocolate and pictures. The English pound was rated at about 13s 6d in lire, we learned.

. . . and Home Again

We expressed our thanks and very reluctantly said our goodbyes in the warm sunshine, and by 1530 hr we were accelerating down the runway for take-off. It seemed to me that in spite of the warmer climate there was a greater feeling of urge on this occasion. No doubt reduced weight had something to do with it. First take-off had been made at 94,986 lb, but this time it was 85,382 lb.

In many ways the journey home was similar to the outward one, but we saw rather more of the ground and in particular of the Alps. Wind and cloud at high altitude, I was told, are not usually very accurately forecast. The weather picture provided at Rome was good for normal use, but the chart extended only to 30,000ft and the information stopped around 20,000ft. A smooth and steady climb was made initially at about 2,500 ft/min and 240 kt I.A.S. with jet-pipe temperature of 620 deg C. At 15.37hr, with 12,000ft on the altimeter, air temperature was still +8 deg C, but ten minutes later it was −19 deg C at 25,000ft (cabin 7,800) and speed was 220 kt I.A.S. Engine speed for the climb was 9,750 r.p.m. (jet temperature was 625 deg C now), and the Machmeter indicated 0.54.

Less than 30 min after taking off we were cruising at 32,700ft. I enquired about a *g* meter on the pilot's panel and learned that the maximum reading so far on that day was just under 1*g* in the cockpit. This is equivalent, it seems, to no more than 0.2 or 0.3 in the cabin. Other readings, as

(*Concluded on p. 384.*)

AIR ESTIMATES

The Figures Analysed : More Money for Technical Equipment

SET out below are details of the eleven "votes" which form the Air Estimates for 1950-51, recently issued in White Paper* form. The Estimates were due to be debated in the House of Commons last Tuesday, March 21st. Issue was preceded by the usual Memorandum by the Secretary of State for Air, a number of points in which had previously been touched upon by the Minister of Defence, as readers will have seen from the leading article in *Flight* last week.

The principal fact which emerges from the Memorandum is that, while there will be a reduction in R.A.F. man-power, there will be a simultaneous increase in technical fighting strength. In all, the Estimate is for a sum of £15,550,000 greater than in 1949-50, the main increase being due to the introduction of more modern types of aircraft and equipment (including radar) and to the gradual exhaustion of stocks of wartime equipment. There is also increased provision for the development of airfields and for the building of additional domestic and technical accommodation. The net total of the Estimates is £223,000,000. Provision is also made for a maximum of £4,900,000 to be issued out of the Consolidated Fund under the Armed Forces (Housing Loans) Act, 1949, for the construction of additional married quarters.

As we remarked last week, in commenting on Mr. Shinwell's statement, the re-equipment and expansion of day fighter squadrons with jet aircraft is continuing, and the Venom, of superior performance to the Vampire, will also be introduced. The Canberra has been ordered in quantity and deliveries should begin during the year. In the transport squadrons, Hastings and Valettas are replacing the Yorks and Dakotas which have given such good service. Further progress will be made with the replacement of existing training types. The production programme provides for a substantial number of jet aircraft for use in Western Union defence.

The Memorandum points out that uniform strength will fall to about 198,000 by the end of 1950-51 compared with 225,000 a year ago, and 202,000 to-day, a decrease in the two years of 12 per cent. Economies have been effected by a number of organizational changes: the transport force in the United Kingdom has been reduced; the Central Bomber Establishment has been abolished and its duties allocated to squadrons; and the Empire Schools have been amalgamated with the R.A.F. Flying College. Substantial reductions are being made in Technical Training Command and in Maintenance Command by the use of improved methods; and staffs of the Air Ministry and larger formations have been reduced in numbers.

As the Minister of Defence has already stated, such measures as these have enabled the necessary man-power to be found to complete the doubling of the jet fighter strength of Fighter Command, while the striking power of Bomber Command will be considerably increased by the formation of new squadrons equipped with B-29s from America.

The Air Minister's Memorandum goes on to review the past year's achievements of the Service and proceeds to sum-up the personnel situation to-day. Regular recruiting is still far from satisfactory; there is a shortage of trained men and a lack of balance between trades persists; and serious deficiencies are apparent in some of the most important and highly skilled trades. The new schemes introduced in September, 1948, for the entry of flying personnel are now yielding results, but there is still a shortage of suitable applicants for short-service commissions as pilots and navigators. Two new forms of regular engagement should materially assist in the problem of manning the regular Air Force. There has been an encouraging improvement in the numbers and quality of candidates for cadetships at the R.A.F. College, Cranwell.

As regards the "works" side of the Estimates, provision has been made for airfields to be extended and strengthened to fit them for use by new types of aircraft; barracks and messes will be improved and, as stated above, there will be a substantial increase in married quarters.

(*Four of the votes appear below; the remainder are on p. 368.*)

* "*Air Estimates, 1950-51.*" *His Majesty's Stationery Office, London. Price 5s.*

VOTE 1 : PAY, ETC., OF THE AIR FORCE. (£52,850,000)

	1950-51	1949-50	Increase (+) Decrease (−)
	£	£	£
Pay of officers	11,790,000	11,930,000	− 140,000
Pay of airmen and airwomen	26,140,000	29,000,000	− 2,860,000
Pay and marriage allowance of local personnel abroad	350,000	280,000	+ 70,000
Marriage allowance etc.	10,540,000	10,700,000	− 160,000
Lodging allowance and London allowance	420,000	450,000	− 30,000
Local overseas allowance	2,795,000	1,780,000	+ 1,015,000
Miscellaneous allowances	235,000	439,000	− 204,000
National Insurance contributions	2,020,000	2,290,000	− 270,000
Extended service bounties	19,000	80,000	− 61,000
War gratuities and Service post-war credits	1,000	1,000	—
Gross totals £	54,310,000	56,950,000	− 2,640,000
Deduct : Appropriations in aid	1,460,000	1,750,000	+ 290,000
Net totals £	52,850,000	55,200,000	− 2,350,000

The decrease in the gross total of this vote is mainly due to lower strengths of officers, airmen and airwomen; partly offset by provision for payment of marriage allowance in respect of a larger number of airmen and increased provision for local overseas allowance consequent upon higher rates and a larger number of families abroad.

VOTE 2 : RESERVE AND AUXILIARY SERVICES. (£1,442,900)

	1950-51	1949-50	Increase (+) Decrease (−)
	£	£	£
Pay, etc., of personnel of the Royal Air Force Reserve (classes A-H)	125,000	42,000	+ 83,000
Pay, etc., of personnel of the Royal Air Force Volunteer Reserve	596,000	574,000	+ 22,000
Pay, etc., of personnel of the Royal Auxiliary Air Force	283,000	262,000	+ 21,000
Grants to territorial and Auxiliary Forces Associations	87,000	86,000	+ 1,000
Air Training Corps	228,000	197,000	+ 31,000
Combined Cadet Force	37,000	38,000	− 1,000
Pay, etc., of members of the Royal Observer Corps	84,000	95,000	− 11,000
Miscellaneous services	4,000	6,300	− 2,300
Gross totals £	1,444,000	1,300,300	+ 143,700
Deduct : Appropriations in aid	1,100	300	+ 800
Net totals £	1,442,900	1,300,000	+ 142,900

The increase in the gross total of this vote is mainly due to the continued development of the reserve and auxiliary services.

VOTE 3 : AIR MINISTRY. (£2,858,000)

	1950-51	1949-50	Increase (+) Decrease (−)
	£	£	£
Salaries, wages, etc.	2,976,000	2,894,800	+ 81,200
Deduct : Appropriations in aid	118,000	111,800	− 6,200
Net totals £	2,858,000	2,783,000	+ 75,000

The increase in the net total of this vote, notwithstanding the reduction in the number of civilian staff since April 1st, 1949, is mainly due to the fact that the cash provision in 1949-50 allowed for a larger reduction in staff during the year than is in fact likely to occur. In addition, increased costs arise from normal incremental progression.

VOTE 5 : MOVEMENTS. (£8,450,000)

	1950-51	1949-50	Increase (+) Decrease (−)
	£	£	£
Conveyance of personnel : travelling allowances and expenses	6,360,000	6,480,000	− 120,000
Conveyance of stores	2,890,000	2,750,000	+ 140,000
Gross totals £	9,250,000	9,230,000	+ 20,000
Deduct : Appropriations in aid	800,000	660,000	+ 140,000
Net totals £	8,450,000	8,570,000	− 120,000

The decrease in the net total of this vote is mainly due to increased provision for recoveries in respect of the inland conveyance of stores issued to other governments and to an expected increase in receipts from fare-paying passengers in Royal Air Force aircraft as a result of higher charges.

AIR ESTIMATES (CONTINUED)

VOTE 4: CIVILIANS AT OUTSTATIONS. (£19,152,000)

	1950-51	1949-50	Increase (+) Decrease (−)
	£	£	£
Salaries, wages, etc., of works staff	2,120,000	2,250,000	− 130,000
Salaries, wages, etc., of meteorological staff	1,040,000	903,600	+ 136,400
Salaries, wages, etc., of aeronautical inspection staff	232,100	247,000	− 14,900
Salaries, wages, etc., of other scientific, professional and technical staff	119,700	108,320	+ 11,380
Salaries, wages, etc., of educational staff	81,200	70,000	+ 11,200
Salaries, wages, etc., of miscellaneous non-industrial staff	5,868,000	5,762,930	+ 105,070
Wages, etc., of industrial employees	10,259,000	11,806,750	− 1,547,750
Gross totals £	19,720,000	21,148,600	− 1,428,600
Deduct: Appropriations in aid	568,000	439,000	− 129,000
Net totals £	19,152,000	20,709,600	−1,557,600

The decrease in the net total of this vote is due to a reduction in the number of civilians (mainly industrial employees), partly offset by higher average rates of pay arising from normal incremental progression.

VOTE 6: SUPPLIES. (£27,900,000)

	1950-51	1949-50	Increase (+) Decrease (−)
	£	£	£
Food and ration allowances	10,846,000	10,759,000	+ 87,000
Solid fuel, electricity and gas	3,662,000	3,344,000	+ 318,000
Liquid fuel, lubricants, etc.	17,000,000	14,750,000	+2,250,000
Miscellaneous supplies and accommodation services	685,000	528,000	+ 157,000
Gross totals £	32,193,000	29,381,000	+2,812,000
Deduct: Appropriations in aid	4,293,000	3,341,000	− 952,000
Net totals £	27,900,000	26,040,000	+1,860,000

The increase in the gross total of this vote is mainly due to higher costs, increased purchases for issue on repayment and provision for cleaning station institutes by contract instead of service labour; partly offset by the effect of lower strengths. The increased appropriations in aid are mainly due to provision for increased issues on repayment.

VOTE 10: NON-EFFECTIVE SERVICES. (£4,345,000)

	1950-51	1949-50	Increase (+) Decrease (−)
	£	£	£
OFFICERS			
Retired pay, half-pay, wounds pensions and compassionate pensions to officers	1,340,000	1,250,000	+ 90,000
Gratuities to officers	666,000	400,000	+ 266,000
Commutation of retired pay and wounds pensions	105,000	81,000	+ 24,000
Pensions, gratuities and allowances to widows, etc., of officers: relief fund	42,000	37,500	+ 4,500
AIRMEN, etc.			
Pensions to airmen, etc.	564,000	466,000	+ 98,000
Gratuities to airmen, etc.	1,290,000	500,000	+ 790,000
Commutation of pensions	24,000	20,000	+ 4,000
Rewards to airmen for gallantry and for meritorious and long service	3,100	5,000	− 1,900
Pensions, gratuities and allowances to widows, etc., of airmen, etc.	28,000	27,000	+ 1,000
CIVILIANS			
Civil superannuation allowances	124,000	112,000	+ 12,000
Compensation allowances (loss of office)	1,000	1,000	—
Non-recurrent allowances (additional allowances and gratuities) —established civilians	97,000	122,000	− 25,000
Gratuities—unestablished civilians	70,003	72,000	− 2,000
Injury grants	72,000	65,500	+ 6,500
Miscellaneous civil non-effective payments	7,000	4,600	+ 2,400
Compensation to members of cadet organisations or to their dependants	3,003	3,000	—
Extra-statutory pension to a former officer of the Polish air force	900	900	—
Gross totals	4,437,000	3,167,500	+ 1,269,500
Deduct: Appropriations in aid	92,000	67,500	+ 24,500
Net totals	4,345,000	3,100,000	+ 1,245,000

The increase under this vote is mainly due to an increase in the number of officers on the retired list and of airmen on the pension list and to increased provision for gratuities payable under short service schemes to officers, airmen and airwomen on completion of service on the active list.

VOTE 7: AIRCRAFT AND STORES. (£78,000,000)

	1950-51	1949-50	Increase (+) Decrease (−)
	£	£	£
Aircraft	54,780,000	50,650,000	+ 4,130,000
Armament and explosive stores	6,750,000	5,320,000	+ 1,430,000
Radio, radar and electrical equipment	9,165,000	6,080,000	+ 3,085,000
Instruments and photographic equipment	5,230,000	3,300,000	+ 1,930,000
Mechanical transport vehicles and marine craft	5,480,000	4,820,080	+ 580,000
Miscellaneous equipment, materials and technical services	5,480,000	3,670,000	+ 1,810,000
Meteorological equipment	325,000	330,000	− 5,000
General stores	3,655,000	3,850,000	− 195,000
Clothing and clothing allowances	4,520,000	4,320,000	+ 200,000
Medical stores	195,000	160,000	+ 35,000
Gross totals £	95,500,000	82,500,000	+13,000,000
Deduct: Appropriations in aid	17,500,000	18,000,000	+ 500,000
Net totals £	78,000,000	64,500,000	+13,500,000

The increase in the gross total of this vote is mainly due to provision for the replenishment of working stocks of equipment and to increased prices.

VOTE 8: WORKS AND LANDS. (£26,440,000)

	1950-51	1949-50	Increase (+) Decrease (−)
	£	£	£
Part I.—New works, additions and alterations amounting to £10,000 each and upwards	14,390,000	10,450,000	+ 3,940,000
Part II.—New works, additions and alterations under £10,000 each	1,000,000	1,000,000	—
Part III.—Ordinary repairs, renewals and maintenance	10,700,000	11,000,000	− 300,000
Plant	550,000	600,000	− 50,000
Grants towards the cost of works	10,000	10,000	—
Purchases of lands and buildings	1,500,000	1,500,000	—
Rents and reinstatements	1,800,000	2,100,000	− 300,000
Surveys and miscellaneous services	50,000	40,000	+ 10,000
Gross totals £	30,000,000	26,700,000	+ 3,300,000
Deduct: Appropriations in aid	3,560,000	3,872,000	+ 312,000
Net totals £	26,440,000	22,828,000	+ 3,612,000

The increase in the gross total of this vote is mainly due to the development of airfields for use by improved types of aircraft, requirements for improved technical facilities and the need for improving living accommodation for personnel at various Royal Air Force stations at home and abroad; partly offset by reduced provision for works maintenance and for compensation charges on relinquishment of war-time holdings of land and buildings and by the transfer to Vote 11 of a large proportion of the cost of providing married quarters at home.

VOTE 9: MISCELLANEOUS EFFECTIVE SERVICES. (£1,562,000)

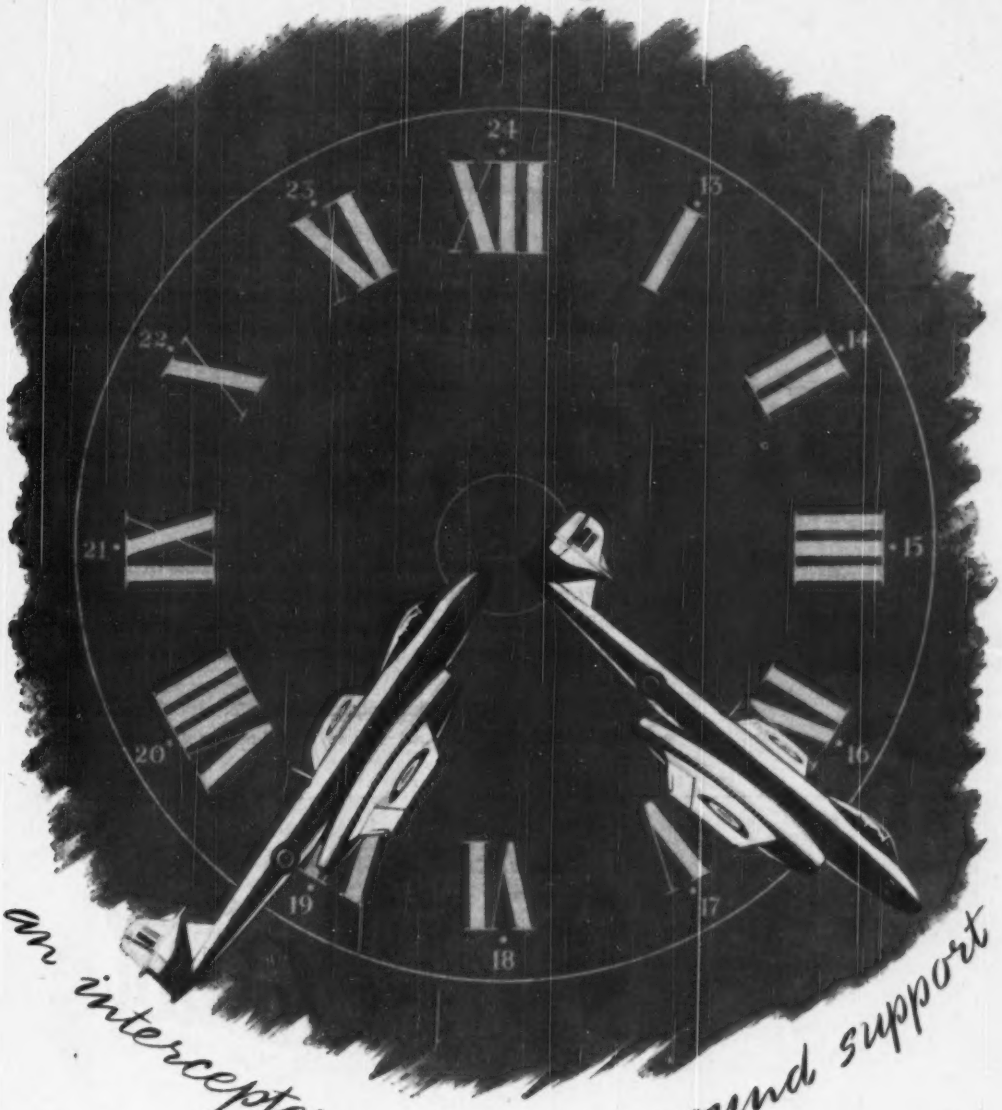
	1950-51	1949-50	Increase (+) Decrease (−)
	£	£	£
Fees and other payments for personal services	255,000	276,500	− 21,500
Training of personnel at establishments outside the Royal Air Force	1,176,000	1,590,000	− 414,000
Miscellaneous educational services	113,000	77,000	+ 36,000
Grants in aid of institutions and associations	27,500	55,000	− 27,500
Miscellaneous welfare expenses	41,000	55,000	− 14,000
Publicity expenses	40,500	55,000	− 14,500
Compensation for losses, damage, etc.	230,000	390,000	− 160,000
Special hospital expenses	46,000	46,000	—
Banker's commission, etc.	10,000	10,000	—
Telecommunication and postal expenses	263,000	290,000	− 27,000
Civil flying services for anti-aircraft practice	270,000	150,000	+ 120,000
Maps and charts	59,000	46,000	+ 13,000
Contributions for services by staffs of other government departments	29,000	25,400	+ 3,600
Sundry expenses	162,000	300,500	− 138,500
Pay, etc., of Polish personnel	—	53,000	− 53,000
Gross totals £	2,722,000	3,419,400	− 697,400
Deduct: Appropriations in aid	1,160,000	1,000,000	+ 160,000
Net totals £	1,562,000	2,419,400	− 857,400

The decrease in the gross total of this vote is mainly due to a reduction in the number of civil flying schools for training personnel of the Royal Air Force Volunteer Reserve and to reduced provision for third party compensation; partly offset by provision for an extension of the arrangements for anti-aircraft practice flying by civil operators. The increase under appropriations in aid mainly arises from an expected increase in the number of pupils of other services to be trained.

VOTE 11: ADDITIONAL MARRIED QUARTERS. (£100)

	Estimates		Increase (+) Decrease (−)
	1950-51	1949-50	
	£	£	£
New works, additions and alterations	4,900,100	—	+ 4,900,100
Deduct Appropriations in aid	4,900,000	—	− 4,900,000
Net totals £	100	—	+ 100

All in the day's work



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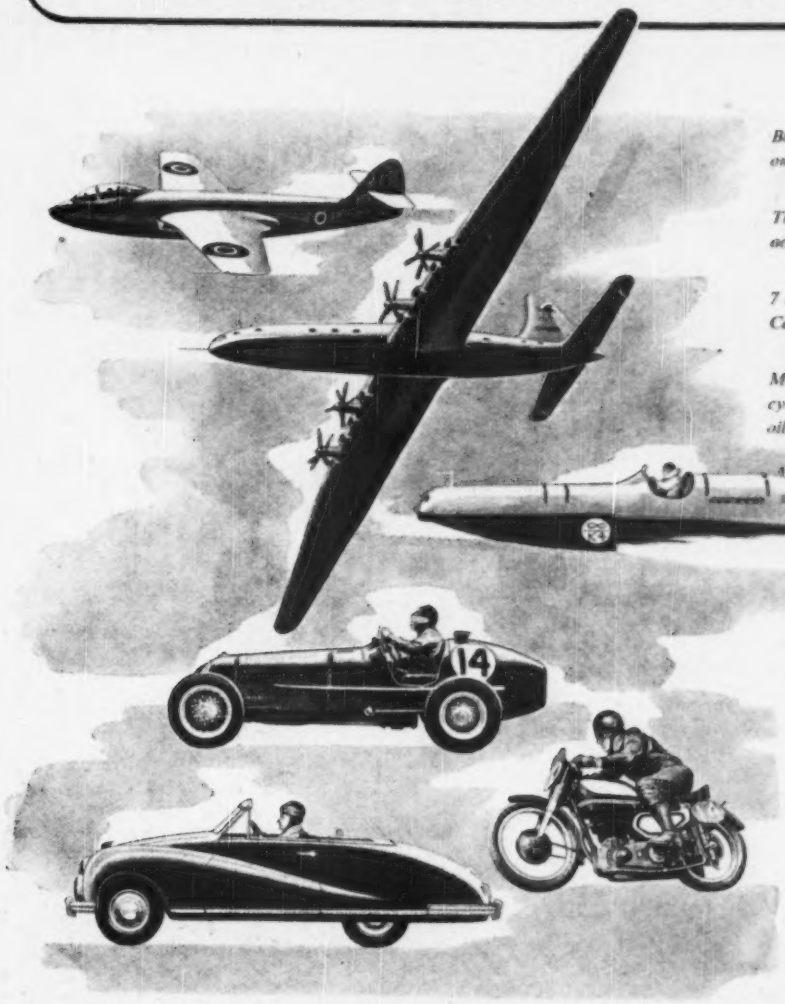

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Every British car and motor cycle maker approves Castrol.

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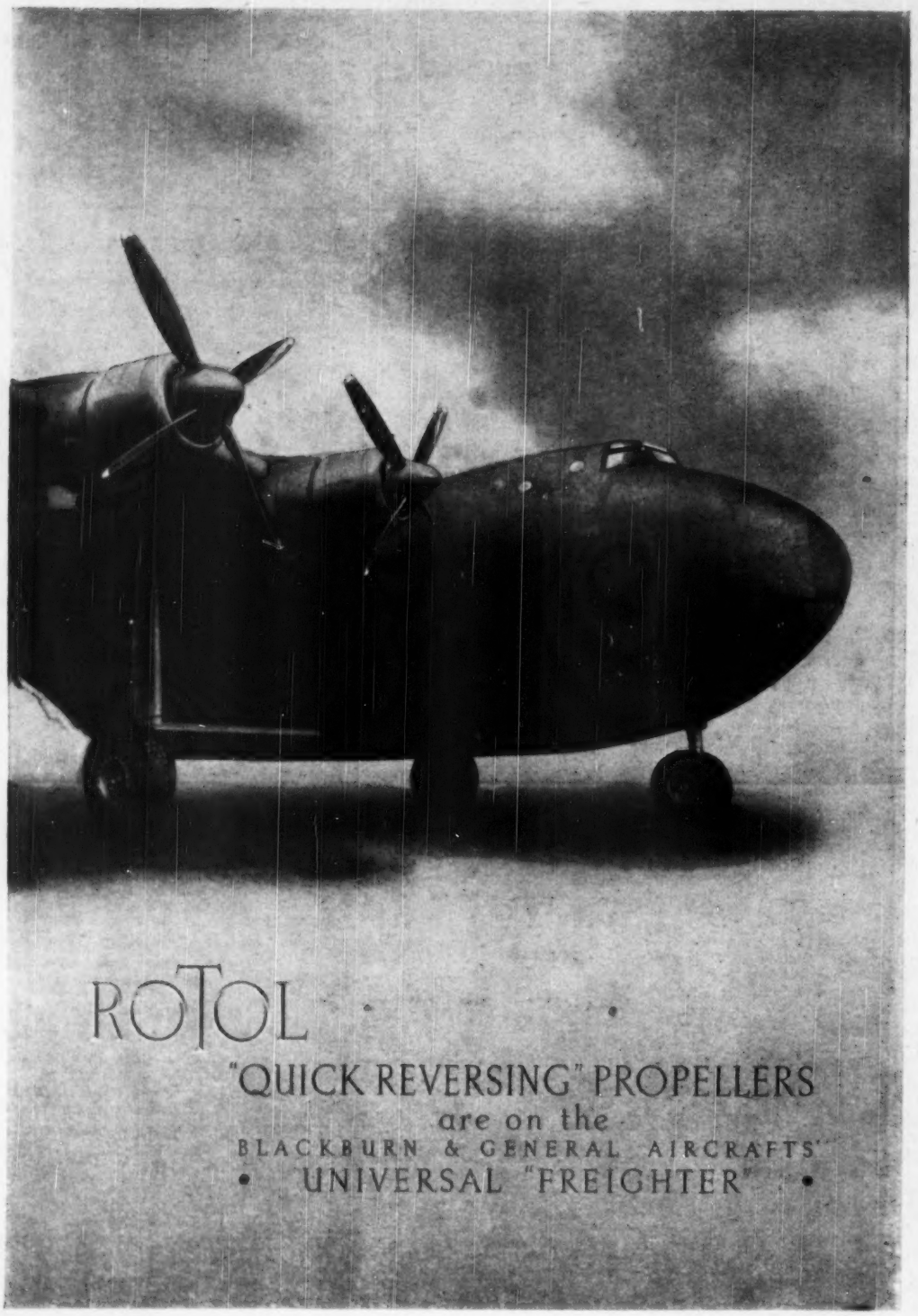
'GIVE ME CASTROL EVERY TIME'


ROTOL
"QUICK REVERSING" PROPELLERS
are on the
BLACKBURN & GENERAL AIRCRAFTS'
UNIVERSAL "FREIGHTER"

HERE and THERE

Bleriot Lecture

SIR FREDERICK HANDLEY PAGE is to deliver the third Louis Bleriot Lecture, in Paris, on May 4th. His subject will be: "Towards safer and slower flying, improved take-off and landing, and cheaper airports."

Ice Wagon

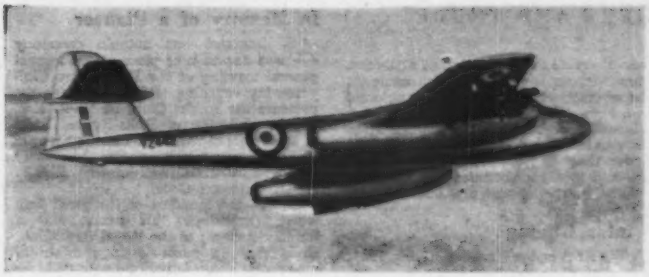
KNOWN as the *Rockcliffe Ice Wagon*, a new R.C.A.F. North Star (Canadair Four), modified for the study of icing, is to seek the worst weather on the Canadian continent. It is fitted with a high, shark-like fin set in the middle of the fuselage (for experimental electro-thermal wing de-icing), a Perspex observation blisters.

Air League's Anxiety

THE Air League of the British Empire, in a statement made as *Flight* goes to press, describes the present defence position as "an unsatisfactory compromise which fails entirely to take account of the conditions of the war of the future." The League demands consistent Government policy towards the industry, more rapid re-equipment of the R.A.F., and stronger efforts to solve the problem of manning the R.A.F.

Pure-Jet Viscount Flies

PILOTED by Mr. G. R. Bryce, the Vickers Tay-Viscount flew for the first time at Wisley, Surrey, on Wednesday, March 15th. Built to Ministry of Supply contract solely for research purposes, this version has two Rolls-Royce Tay turbojets in place of the four Rolls-Royce Dart turboprops fitted to the first prototype; the latter aircraft, incidentally, began its first European demonstration tour last Monday.



GLOSTER ROCKETEER: Seen with its complement of eight 90-lb rocket projectiles is a Meteor 8 fighter, as now in production for the R.A.F. Air-to-air R.Ps for attacking bomber formations are advocated in a leading article on page 363 of this issue.

Outside Interest

NO. 80 Reserve Centre, R.A.F.V.R., based at Hornchurch, is to be congratulated on its initiative in organizing a series of aeronautical outings for its members. Ground crews were recently taken on a conducted tour of London Airport, and the de Havilland Aircraft Company has now made possible a trip to the Hatfield factory, where reservists will see Comet, Vampire and Chipmunk production.

Fire and Water

TWO prototype fire-floats specially designed for use by the R.A.F. in combating flying-boat fires were demonstrated last week at Portsmouth. The craft, which are from the yard of Vosper, Ltd., will be described and illustrated in a subsequent issue of *Flight*.

Back in Harness

MARSHAL of the R.A.F., Lord Tedder, who recently retired as Chief of the Air Staff, will next month take over his newly announced duties as Chairman of the British Joint Services Mission in Washington. As such, he will also be Britain's representative on the standing group of the North Atlantic Military Committee. The selection of Lord Tedder to occupy this revived wartime post accentuates the importance of the North Atlantic integral defence policy.

The B-29s

THE first of the seventy Boeing B-29 Superfortress bombers allocated to Britain under the military aid programme were due to arrive yesterday, after having been ferried across the Atlantic by American crews.

No Trunk Route

ACCORDING to a report from Bombay, B.O.A.C. recently had to refuse a cargo of two elephants which they were requested to fly to London for transfer to a P.A.A. service to Washington. Elephants are considered too dangerous as air passengers when more than six months old—which, remembering what one did in a railway truck in the North of England a few months ago, seems reasonable.

Dr. Alexander Klemin

IT is with regret that *Flight* learns of the death of Dr. Alexander Klemin on March 13th, at his home in Greenwich, Connecticut. Dr. Klemin was born in London in 1888, and went to the United States in 1912. He had a distinguished career in American aviation, and, in addition to being a director and professor at the Guggenheim School of Aeronautics, was a consultant to the Navy Bureau of Aeronautics, to the U.S. Air Mail Service, to the C.A.A., and to aircraft manufacturers.

The Canberra—A U.S. View

WRITING in our American contemporary *Aviation Week*, Mr. Robert McLarren summarizes his views on the Canberra in the following terms: "It would appear that the Canberra is an admirable airplane with unusually high performance, a high cleanness of exterior line and unusually smooth handling characteristics. It has excellent high-altitude characteristics and is highly

PLOUGH LANE PARTY: At the Aerodrome Hotel, Croydon Airport, last Friday evening, some 120 of those who served at the airport before 1927—when the buildings were over on the Plough Lane side—gathered for a celebration. From an exact replica of the control tower the chairman, Capt. Lamplugh, gave each reminiscing speaker the "green". This photograph of some of the old hands shows, left to right, Jimmy Jeffs, Gordon Olley, Dallas Eskell, "Lamps", Jerry Shaw and Leonard Pace who organized the dinner. "Flight" photograph

HERE AND THERE . . .

manœuvrable at all speeds and altitudes. However, on the basis of this analysis, the aircraft would appear best exploited as a high-altitude, short-range, two-man, all-weather fighter. In this configuration its maximum speed would fall slightly under that of the best U.S. designs at low and medium altitudes but would be definitely superior above 35,000ft."

Winter Gliding

AWARDS in the Kemsley Flying Trust winter cross-country gliding competition are announced by the B.G.A. as follows:—*Aero-tow class.*—1st prize (25 gns), J. Karran (Olympia), 66 miles on February 28th; 2nd (15 gns), L. Welch (Weihe), 58 miles on February 28th; winner's launch prize (10 gns), Surrey G.C. *Winch, auto or "bungee" launch class.*—1st (25 gns), G. H. Stephenson (Olympia), 56 miles on December 17th; launch prize (10 gns), London G.C. A special consolation prize of 15 gns goes to J. Grantham and P. Sullivan (Kranich two-seater) for 34 miles from an aero-tow launch on February 21st.

The Science of Control

THE Society of Instrument Technology announces the formation of a "Control Section," to cover the theory and practice of closed-loop control systems, including servo mechanisms, regulators and process controllers. An inaugural meeting is to be held on March 28th at 6.30 p.m. at the Royal Society of Tropical Medicine and Hygiene, Manson House, Portland Place, London, W.1, when three papers will be read by: Professor K. A. Hayes, *Servo Mechanisms, Recent History and Basic Theory*; Dr. A. Utley, *The Problem of Stabilization*; and Professor A. Tustin, *Problems in Control Systems which await Solution*.

In Memory of a Pioneer

AN informal but notable ceremony was due to take place at the annual general meeting of the Royal Aero Club yesterday evening (March 22nd)—the presentation to the Club, by Capt. Eric Smith, chairman of Rolls-Royce, Ltd., of a portrait of the Hon. Charles Stewart Rolls. The portrait—shown here—was painted by the well-known R.A.F. artist, Cuthbert Orde.

One of the founders of the great firm which perpetuates his name, and a founder-member of the Royal Aero Club, Rolls was an enthusiastic and skilful pioneer racing motorist and aeronaut; he made a balloon ascent in 1901, owned a series of balloons, and made his 100th ascent in 1908. He then turned his attention to heavier-than-air craft, acquiring a Wright biplane; and it was in this machine, at the Bournemouth aviation meeting of 1910, that he lost his life. He was taking part in what was probably the first "spot-landing" competition.

PIONEER: The portrait of the Hon. C. S. Rolls which, as recorded on this page, has been presented to the R.Ae.C.

NEWS IN BRIEF

WEST London Aviation Club is holding a film show (to which all interested are invited) at Beaufort House, Lillie Road, Fulham, to-morrow evening (March 24th), beginning at 8 p.m. The two *British Aircraft Industry* films, 1948 and 1949, will be shown.

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Mr. Derek Tinker, managing director of T. and J. Tinker, Ltd., Holmfirth, Yorks, is visiting the United States and Canada. He plans to obtain dollar orders for Yorkshire fabrics, including—in the face of American competition—furnishing materials for Canadian civil aircraft.

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Flight regrets to record the death of Mr. J. A. H. Sargeaunt, senior technical liaison engineer to Teddington Controls, Ltd. "Jimmy" Sargeaunt, who served with the R.A.F. and was eventually taken prisoner in the desert, will be missed by a great many Service friends with whom he kept contact. His death occurred, on March 5th, at the early age of 39, from heart failure after a game of squash racquets.

• • •

The British Engineers Small Tool and Equipment Co., Ltd., announce the appointment of Lt. Col. T. Child, R.E., T.D., B.Sc., M.I.Mech.E., as general manager. Up to now he has been manager of the testing-machine division of W. and T. Avery and Co., Ltd.

• • •

B. E. Boyce, winner of the Baden Powell Memorial Prize for the best candidate in the December, 1949, R.Ae.S. Associate Fellowship Examination, was a student of the College of Aeronautical and Automobile Engineering. Students also obtained first places in applied mathematics and theory of mathematics.

• • •

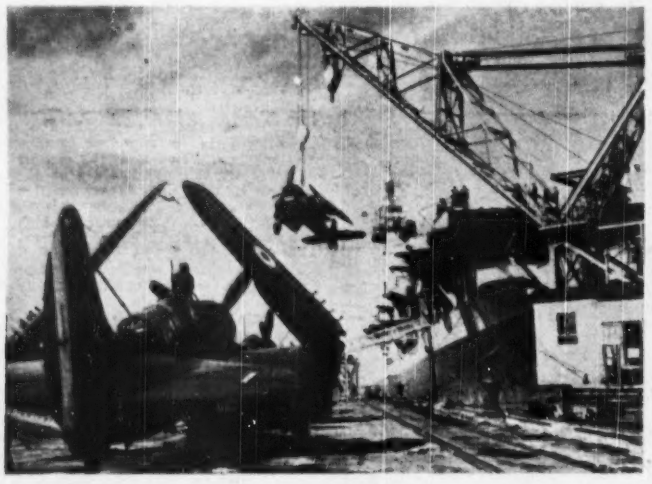
Mr. E. H. Goater is to represent Wm. Jessop and Sons, Ltd., and J. J. Saville and Co., Ltd., in the Leeds area, and will be succeeded in the Sheffield area by Mr. A. W. Pryor, with offices at 25, Castlewood Road, Fullwood, Sheffield, 10. The two companies have also appointed, as South Wales representative, Mr. R. S. Lloyd, 46, Bryn Road, Brynmill.

• • •

Accles and Pollock, Ltd., Oldbury, Birmingham, deserve congratulation on a most original brochure published to commemorate half a century of tube manufacture. Entitled *Have You a Trumpet Handy?* it contains a great many photographs of considerable intrinsic interest, and the text shows a wit as nicely polished as the tubes with which it deals.

• • •

Reviewing progress of de Havilland Propellers, Ltd., at the company's annual general meeting, Mr. W. E. Nixon (chairman) said that they had more than 30 types in current use or development, ranging from light-aircraft installations to counter-rotating airscrews capable of absorbing 10,000 h.p. and intended for turboprop transports of the coming era. (An article on D.H. airscrew development appeared in *Flight* last week.)



RAISING HELLCATS: Under the American arms-for-Europe plan, the carrier *Dixmude* is ferrying some 50 aircraft to France. This view alongside the ship recalls wartime Pacific actions: a Grumman Hellcat naval fighter is being loaded on to the deck, and the type in the foreground is a Curtiss Helldiver dive-bomber.

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THE DE HAVILLAND ENGINE COMPANY LIMITED, EDGWARE, MIDDLESEX, ENGLAND

Discernible at the rotor tips in this recent view of the Top Sergeant are the pulsejet units, now highly developed.

"TOP SERGEANT"

REJOICING in the sobriquet Top Sergeant, the little pulsejet helicopter shown here is a product of the American Helicopter Company, of Manhattan Beach, California, and is the outcome of a U.S.A.F. research and development contract. For this class of machine the makers consider that the payload for a one-hour flight should be double that of a piston-engined helicopter of the same gross weight. Production cost is estimated at a quarter of that of the lowest priced commercial helicopter available to-day, and the maintenance and overhaul costs of the pulsejet power units should, in turn, be a quarter of those for a conventional engine.

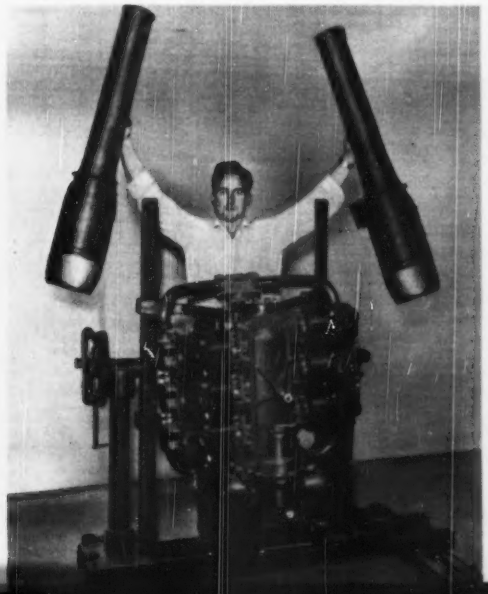
Many problems connected with the pulsejet power units are said to have been eliminated under the U.S.A.F. contract. Early units failed under whirl loads of up to 200 *g* but no structural weakness is now apparent. The valve blocks (the only moving components), which initially had a relatively short life, now give promise of a life of 30 hr or more. Replacement of a worn block can be effected in 5 min and represents the only "major overhaul" required.

It is stated that a new configuration recently evolved will substantially reduce the drag of the jet units (mounted at the rotor tips) and simplify autorotation problems. A spokesman for the manufacturers states that massive pulsejet helicopters, of "flying crane" form, would carry their power plants buried within the rotor structure, thereby presenting only minor drag problems. Studies indicate, however, that pulsejet size, and unit thrust, will not have to be increased for greater all-up weights; it will merely be necessary to increase the number of units per blade to achieve the required thrust.

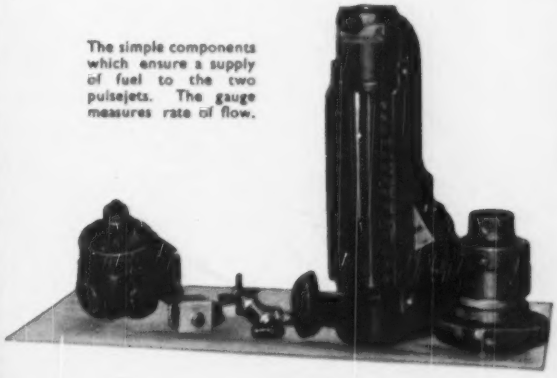
Components of the fuel-supply system of the Top Sergeant are an electrically driven fuel pump, throttle, master shut-off valves, fuel flow gauge ("rotometer") and a rotary fuel-line transfer seal—the latter purchased "off the shelf" from an oil-well supply firm. The only highly loaded moving parts in the structure are the two rotor mounting bearings.

Mr. Corwin D. Denny, president of the manufacturing concern, is reported as saying, "At times the absence of a welter of moving parts, whirling and bobbing up and down, amazes even us. It's like discovering a good 5-cent cigar!"

The pulsejets compared with a piston engine for similar duties.



The simple components which ensure a supply of fuel to the two pulsejets. The gauge measures rate of flow.



UNIVERSAL FREIGHTER

An Appraisal of the Blackburn and General Aircraft High-capacity Cargo-carrier

BY comparison with the various forms of surface transport, aircraft have been virtually disregarded as cargo-carriers; and yet the overwhelmingly greater proportion of transport revenue is derived from freighting—passenger traffic on road, rail and sea represents but a thin froth on the solid base of cargo revenue. It is therefore at first sight somewhat curious that, until recently, aviation "big business" should have resigned itself to exclusion from so fruitful a field of reward.

The reasons are, however, not hard to find. Before the war it was not a practicable proposition to build a freighter aircraft which could stand on its own in competition with other means of conveyance except in the most severely limited conditions. In addition, the design "know-how" was lacking—and the importance of this quality is only now coming to be realized at its true worth. The advances in aeronautical technology which resulted from the urgency of war, however, changed the situation considerably; not only that, the demands of war itself fathered the need for aircraft capable of transporting loads which were both bulky and heavy.

General Aircraft, Limited (now amalgamated with Blackburn Aircraft, Ltd.) first became constructively interested in the carriage of unwieldy goods by air when, in 1940, the Service requirement for an aircraft which could carry a 7½-ton tank was made known. The result was the Hamilcar glider. The creation of this aircraft led Mr. F. F. Crocombe and his design team to focus a great deal of attention on the whole subject of bulk transport, and an interim outcome of their design research was the Hamilcar X power-assisted glider. It was, however, apparent that all-round efficiency—in its widest commercial sense—could best be obtained by a rather more orthodox concept and this led to the design of the Universal Freighter.

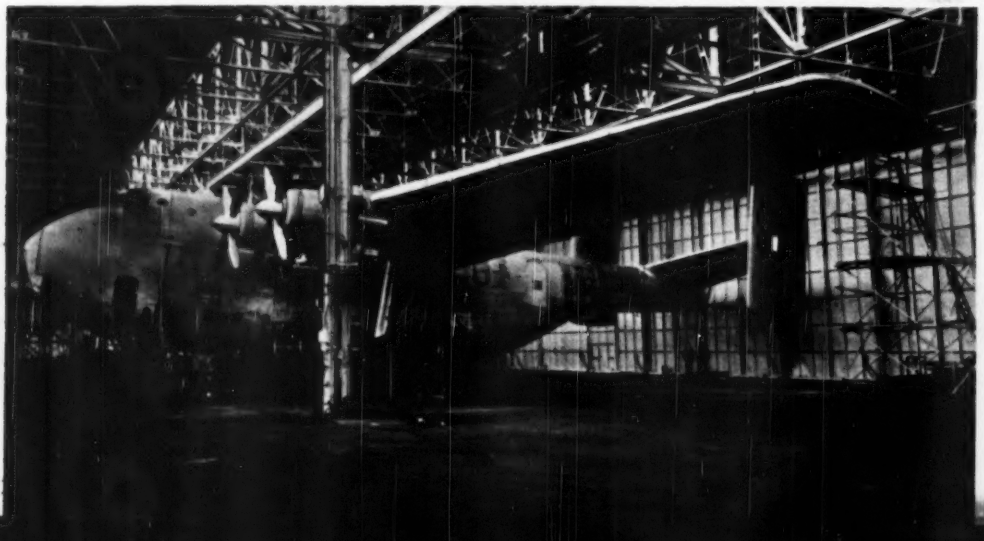
The fact that General Aircraft did not come *de novo* to the job of designing a cargo transport, but had their outlook on the problem coloured by factual experience, makes it not unnatural that the Universal Freighter should bear a close affinity to the Hamilcars in physical design. In fact to some extent it confirms, by implication, the "rightness" of the Hamilcar concept.

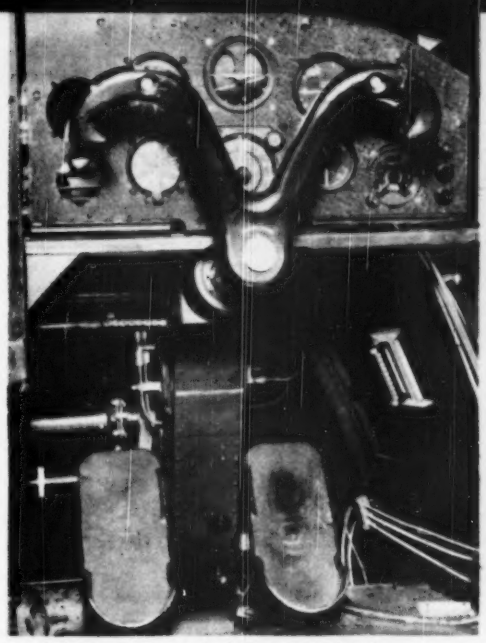
Despite the fact that a freighter aircraft is a highly specialized type, the design criteria are such that optima are fairly readily derivable. A prerequisite is, of course, economy of operation and this lays down the boundaries of aircraft size, payload capacity and performance. Preliminary studies "ringing the changes" on the several factors serve to indicate the broad outlines of a specification which will produce the maximum return on the prime and operating costs. Having decided upon the optimum from these considerations there remains the physical design layout of the aircraft: high- or low-wing, front- or rear-entry (or both), retractable- or fixed-undercarriage, twin- or single-tailboom, and so on and so forth. In some degree these questions will be settled by aerodynamic considerations versus the necessity for keeping everything as simple and straightforward as possible, for in aviation perhaps more than in any other field, simplicity means reliability, and reliability is virtually another name for profit.

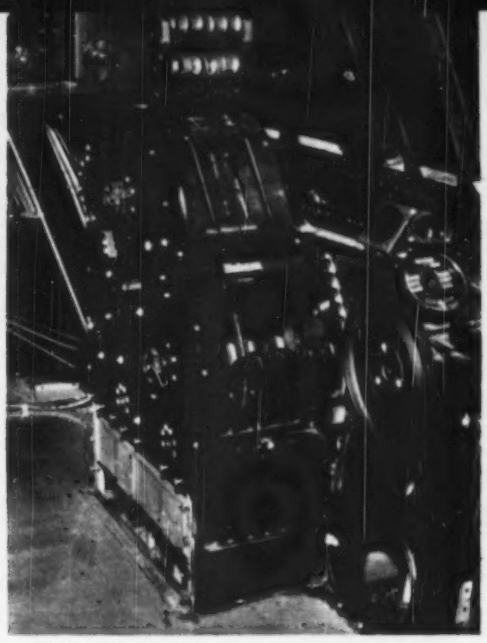
In essence, the belief held by Mr. Crocombe is that the most potentially successful form of air freighter is one in which the cargo-carrying capacity is surrounded by the least amount of simple aircraft, without undue sacrifice of aerodynamic efficiency, which is capable of doing the job. The Universal Freighter is a physical expression of that belief: it is a synthesis of the varied factors which prescribe the design formula for an aircraft intended to handle large amounts of heavy cargo over longish ranges anywhere in the world.

More specifically, the primary requirements for a truly universal freighter aircraft may be epitomized as carrying capacity wedded to economy and reliability, and the ability to operate with the minimum airfield facilities and a minimum crew. These qualities the Universal Freighter possesses in brimming measure. It can carry 14.4 tons payload for a 250-mile stage length with standard fuel-reserve allowances, or 7.25 tons for a 1,750-mile stage;

Scale is given to the actual size of the Universal Freighter by the human figures. The nose is lifted so that the rudders clear the roof.







Detail photograph of second pilot's control unit and instrument panel and (right) the throttle and airscrew control console with, rearward of it, the box carrying the trim controls. Above the throttle box can be seen the crank handle for adjusting rudder pedal position.

the operating costs (calculated on S.B.A.C. definition) work out at 10.5 pence/ton-mile for a 14.4 ton/250-mile payload-range, and 15.3 pence/ton-mile for a 7.25 ton/1,750 miles payload-range. The simplicity of everything about the aircraft could scarcely be bettered from operational reliability and servicing maintenance viewpoints. The aircraft can take-off at its maximum all-up weight of 105,000 lb and clear a 50ft screen in 970 yds (zero wind), and can land over a 50ft screen in 1,075 yds (zero wind), which is reduced to 920 yds with airscrew braking; furthermore, it can operate at *maximum all-up weight* from *grass fields*. Finally, a crew of two is all that is necessary, although, naturally, the normal provision is made for a navigator and a radio operator in addition to the captain and 2nd pilot.

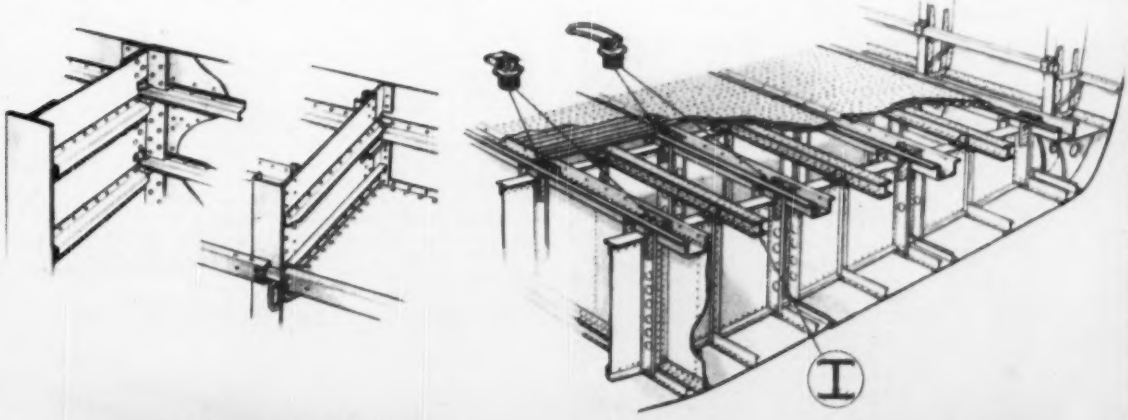
A word or two should be said about the universal aspect. In order that the various mountain ranges which exist throughout the world should not become barriers, the aircraft has a cruising altitude of 18,000ft at 98,000 lb—amply sufficient to overcome such hazards of terrain. Its permanent fuel tankage of 2,400 gall is sufficient to give it a still-air range of 1,570 miles, but with one extra tank in each wing the still-air range is 2,500 miles; in addition, the integral provision of "excess" oil capacity is enough to look after flights of particularly long range for which extra fuel tankage would be used. The aircraft is essentially one which would be flown from one sphere of operations to another—for example from Canada to Australia or South Africa—and it has been expressly designed to operate in all climatic conditions and, further, to stand in the open without protection in those conditions.

The description "Colossus of Loads," applied to the Universal Freighter, is certainly not undeserved, for the aircraft is immense. A wing-span of 162ft is a large dimension by any standard, but when allied to an enormous slab-sided fuselage, which is 12ft wide and which has its cabin-top 22ft above the ground, the impression of great size is markedly enhanced. In connection with the designer's postulate of surrounding the cargo space with the least amount of aircraft, the natural inference is that the capacity of the cargo space must be extraordinary; and it is. The *uninterrupted* space available for cargo measures 36ft × 10ft × 10ft and that gives as many cubic feet of stowage space as there are seconds in an hour. Further, there is an additional stowage volume on the raised floor in the nose, and by the fitting of an upper deck over the rearward portion of the main cargo-hold, seats can be provided for 18 passengers. A toilet compartment is provided in the tailboom.

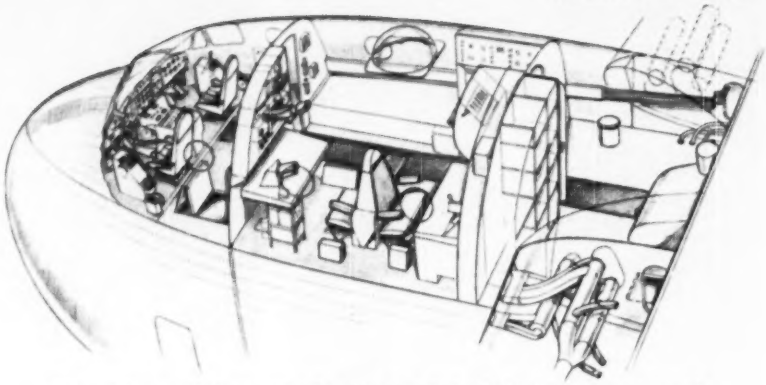
Some diversity of professional opinion exists about the

Details of fuselage frame at wing-spar station (left), and normal fuselage frame showing sturdy lashing rail and ring (right).

Massive construction of the cargo floor. The left-hand lashing point is a 1-ton type and the right-hand unit is a 5-ton type.



UNIVERSAL FREIGHTER..

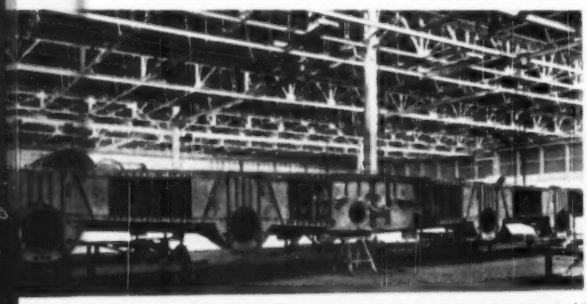


Flight-deck layout. Navigator and radio operator sit back-to-back with a rest bunk opposite.

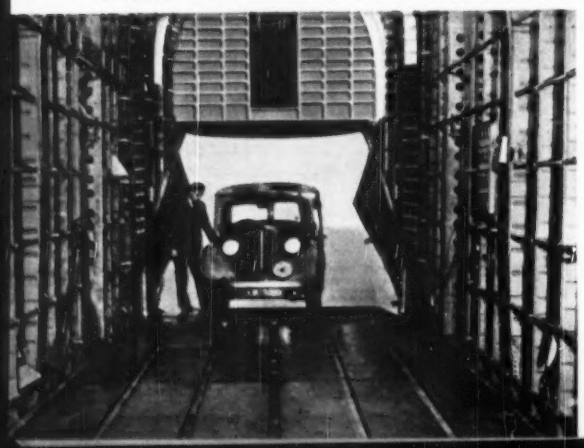
advisability of carrying cargo and passengers at the same time. In the view of the writer, however, it appears eminently sensible to cash in on space which would otherwise be unoccupied. There are, undoubtedly, many people who would be prepared to accept the minimum of "luxury" in order to fly, say, from London to Paris, at a reduced rate, whilst the benefit of secondary passenger seats in the aircraft when operating in undeveloped regions of the world is so clearly apparent as to require no further comment.

Taking the cargo-hold as the structural nucleus, the "surrounding" elements of the fuselage are the nose compartment, the flight-deck, the upper rear fuselage and the tailboom, all of these, with the wings and tail surfaces, being built as major sub-assemblies which are then brought together to form the basic structure. The detail form of structure employed is completely straightforward; it is, in fact, precisely what one would expect a competent design team to produce in answer to the requirements—a plain, rugged, uncomplicated fabric on entirely orthodox structural principles. There is, however, one novel feature, namely, the use of D.T.D. 687 high-tensile duralumin sheet. The mechanical properties of this material are such that reduced gauges may be employed without sacrifice in strength—and the problem of weight increase as a result of sheet thicknesses being generally toward the top limit of tolerance assumes some considerable importance in an aircraft the size of the Universal Freighter with its span of 162ft and weight of 105,000 lb.

The wing centre-panels are joined on the fuselage centre-line.



A 10-cwt van is a small load for the Freighter's immense hold



Although the dimensions of the cargo-hold are extraordinary enough, the strength of the floor matches them. On the supporting gridwork are carried 54 panels, particularly designed for bearing strength, the realized value being 325 lb/sq ft. The equivalent maximum in terms of vehicle axle-load is 9,000 lb. Between the panels are distributed rows of lashing shackles alternately of 5½-ton and 1-ton load capacity, and at five frame stations along the walls are fitted three tiers of 1-ton shackles in conjunction with the horizontal lashing rails which are anchored on the free flanges of the frames. Lights at roof and floor level provide additional illumination to that derived from the 12in-diameter windows which are spaced at 40in centres along each wall.

At the forward end of the main cargo floor the nose compartment is floored at a higher level and this serves as the normal mounting platform for an electrically operated loading winch. The mounting arrangement is, however, such that if necessary, the winch can be removed down to the cargo floor itself and be anchored to the floor lashing points. An entry door on the port side of the forward fuselage opens into a well in the raised floor from which a jack ladder gives access up to the flight-deck, emerging through a hatch behind the captain's seat. The flight-deck itself has a spaciousness which is thoroughly in keeping with the rest of the aircraft and in instrument and control layout leaves nothing to be desired. With the exceptions of nosewheel steering, which is provided only for the captain, and engine instrumentation, which occupies the centre of the facia panel, all controls and instruments are duplicated.

The design and manufacture of the flying, trimming, engine and airscrew control systems is the work of Aero Controls, Ltd., of Northampton. Each pilot has a similar main control unit interconnected by torque-shafts for dual-control purposes and linked with the servo-units of the Smith S.E.P.1 electric autopilot; further, each pilot has a trim control box outboard of his seat. The Aero Controls system embodies the novel feature of push-pull transmission for the main flying controls, and the employment of the push-pull tubes as torsion-shafts for trim tab control transmission. The detail design of the system is such that there is no interaction between the separate functions, although, of course, the trimmer transmission has to be so arranged as to by-pass the Fairey hydro-boosters which provide hydraulic power-assistance in the main control transmission. The fact that rudder trimming is done through the elevator circuit and elevator trimming through the rudder circuit provides some measure of safety "insurance." The elevator trimming circuit also incorporates an electric actuator whereby each pilot can make rapid trim compensation through press-buttons on the "ram's-horns" control handles.

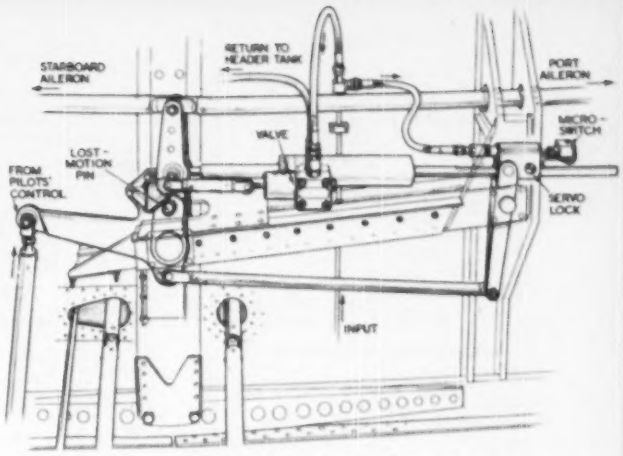
The engine and airscrew control consoles (which are

fitted immediately ahead of the trim boxes) have been developed in conjunction with H. M. Hobson, Ltd., and the control locking arrangement is such that when the controls are locked, the interference of integral cams allows only two engines to be opened up to full throttle; either the inboard or the outboard pairs can be given full (ground) boost, but not all four. For reversed-pitch braking, the throttles are pulled back beyond the "normal shut" position, but cannot pass this point until a trip button on the inboard lever is depressed.

Recommendations by the Department of Aviation Medicine at Farnborough were followed in the design of the pilots' seats and although "alert," "cruising" and "resting" settings are provided for the seat back, adjustment for the seat as a whole is provided only vertically; correction for leg reach is made through small crank handles on the facia panel, whereby the rudder pedals can be moved to the requisite position. The seat location is such that the front-, bow- and side-screens are substantially equi-distant from the pilots' eyes. The front-screens are electrically heated for icing prevention and are each furnished with Dunlop-Wylie windscreen wipers; the bow-screens each incorporate direct-vision panels and the framing is of welded magnesium.

Aft of the bulkhead behind the pilots' seats, the navigator and radio operator are provided with back-to-back seats on the port side of the compartment. The rear wall of the flight-deck is made up largely by the front spar of the wing centre-section—on which is carried the hydraulic servo unit for the ailerons—and in each wall of the compartment are apertures giving access to the crawl-ways in the leading edges of the wings.

Port and starboard wings are made in outer and inner panels—the joint occurring at the flap/aileron station—and the two inner panels are joined together on the fuselage centre-line. Structurally, the wings are quite orthodox and depart from accepted practice only in the use of integrally swaged pressings of warren-girder form which are riveted together to make up the webs of the chordal ribs in the outer wing panels, and the trailing-edge ribs in the outboard one-third of each centre panel: the remaining inter-spar and trailing-edge ribs are of diaphragm-type. The Marston Excelsior bag-type fuel tanks, each of 600 gallons capacity, are carried in pairs in the inter-spar cells at the extremities of the centre-wing panels, with an optional third tank port and starboard housed in a separate cell at the inboard end of each outer panel. Pulsometer immersed-type electric fuel pumps feed from the inner and middle tanks into a collector-box mounted on the front face of the front spar (the middle and outer tanks are interconnected). Each tank is wired for Pacitor-type contents gauges and a Plessey electric priming system is fitted. With the exception of the main engine cocks, which are mechanically controlled from the cockpit console, all fuel cocks are electrically actuated. Three refuelling points are fitted on each side of the fuselage, those on the port side being supplemented by a de-fuelling point which tees into the cross-feed pipe.



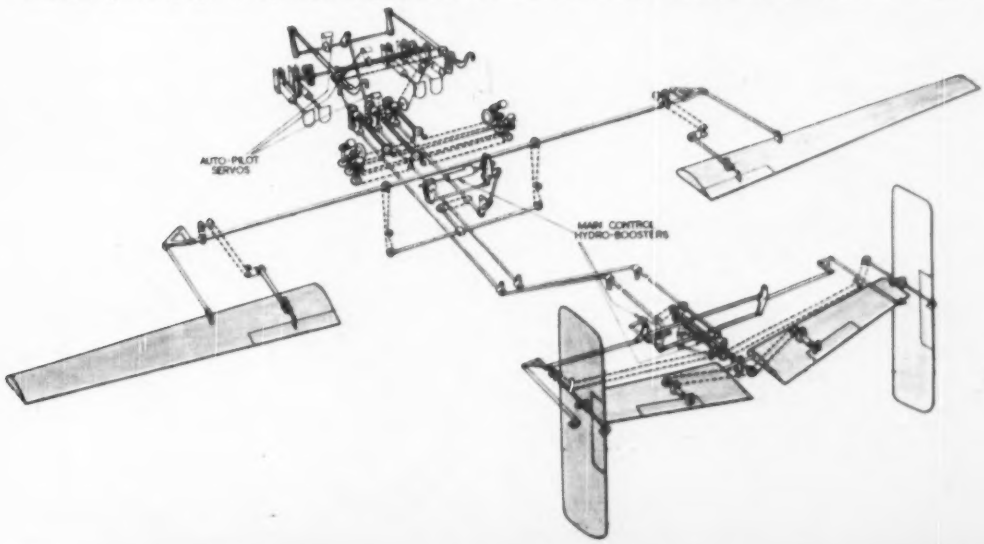
Detail of aileron hydraulic-servo unit mounted on the front spar.

Although the ailerons are conventional surfaces of set-back-hinge type with balancing masses in the leading edge and horn balances at the tips, the flaps are somewhat less usual. They are of N.A.C.A. slotted type, supported on duplex linkages at each end and at the centre station, the pivotal geometry being such as to give combined rearward and rotational movement. An Evershed and Vignoles electrical follow-up system is employed for flap control, the flap following the control movement until it overtakes, at which point the power is cut off. Synchronization is effected through a differential unit, whereby if either flap is leading by 2 deg or more, its motor is switched off until the other flap overtakes; in the event of an electrical failure, the flaps cannot exceed 2 deg difference in setting. The actual operating system in each wing comprises three Rotax high-efficiency screw-jack actuators of recirculating ball-bearing type. Each outboard and inboard screw-jack is driven by torsion-shafts from the centre screw-jack, which is powered direct from an integrally mounted 4 h.p. electric motor.

Inboard of the inner engines, in each leading edge, are

(*Continued after double-page drawing of the Universal Freighter*)

Schematic layout of flying control system, showing disposition of servo units and arrangement of push-pull/torsion-rod transmission.



UNIVERSAL FREIGHTER

Engines : Four Bristol Hercules 761 of 2,020 h.p. each, driving 14ft diameter Rotol airscrews

Span	162ft
Length	99ft 2in
Height	33ft
Wing area	2,916 sq ft
Aspect ratio	9
Dihedral	54min 31sec
Incidence	5 deg 30 min
T/C ratio, root	21.6 per cent
tip	12.6 per cent
Tailplane span (projected)	42ft 1.7in
T/p and elevator area, gross (projected)	527 sq ft
Fin and rudder area, gross	388 sq ft
Undercarriage track	36ft
C.G. range, per cent of S.M.C., fronc limit	17
aft limit	28
neutral point	40

Estimated Performance at 185,000lb A.U.W.

Max all out speed	225 m.p.h. T.A.S.
Max cont. cruise	216 m.p.h. T.A.S.
Recomm. econ. cruise	168 m.p.h. T.A.S.
Recomm. cruise, 2 engines dead	139 m.p.h.
Climb speed and rate	120 m.p.h. T.A.S. at S.L. — 620 ft/min

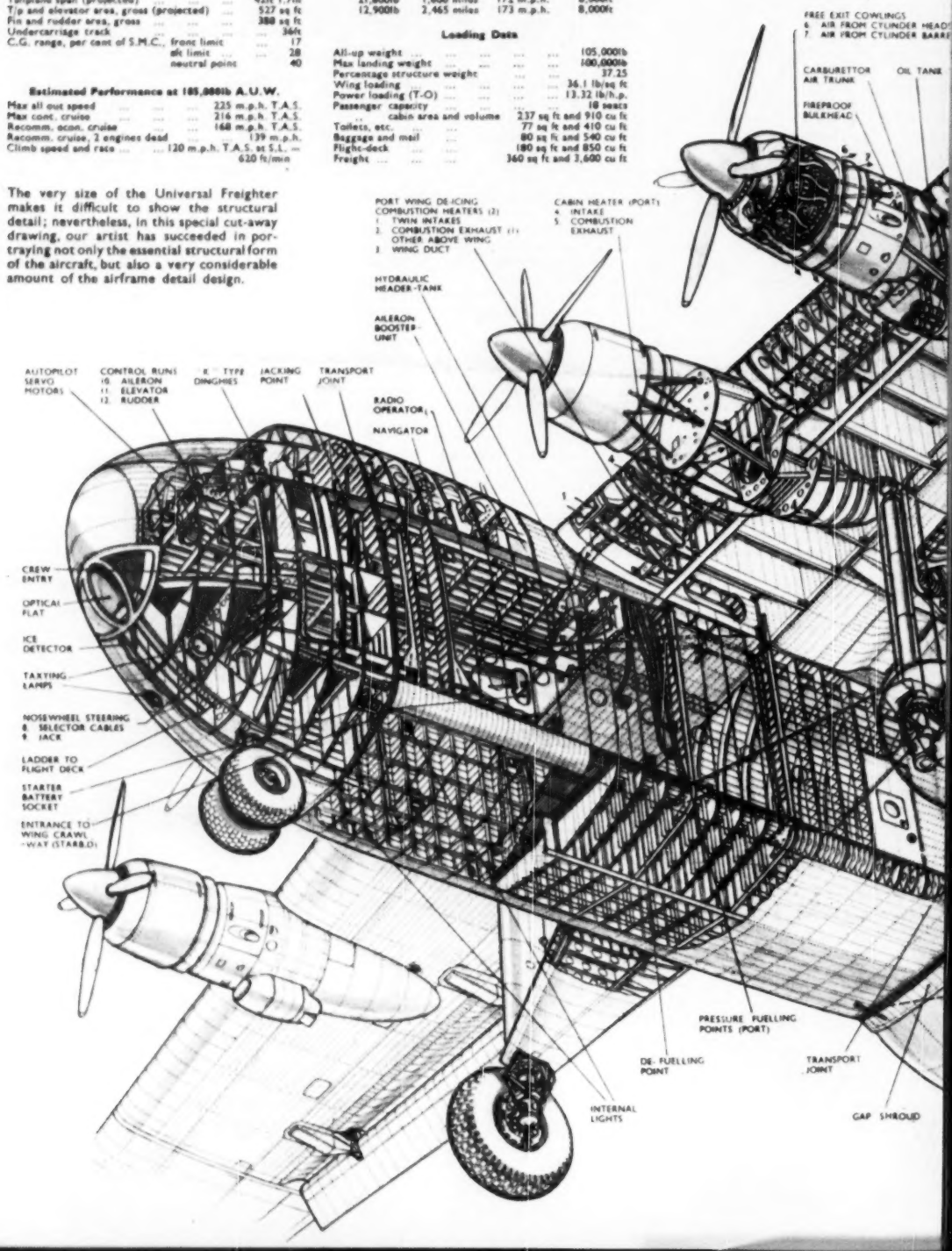
Stalling speed, flaps down	83 m.p.h.
flaps up	100 m.p.h.
Service ceiling	19,400ft
Take-off distance to clear 50ft, zero wind	970 yd
Distance to stop from clearing 50ft, zero wind, braking airscrews	700 yd

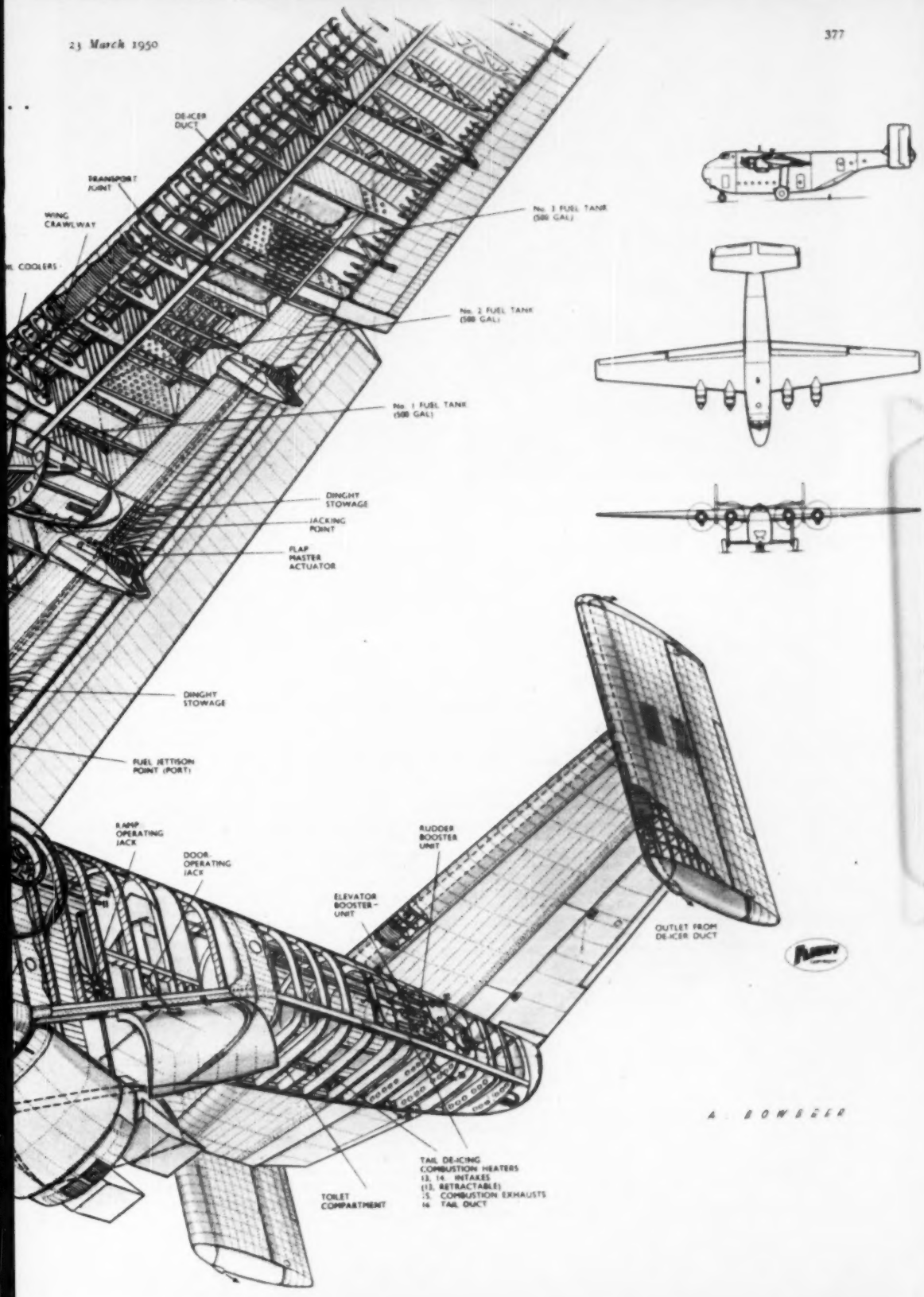
Payload	Range	Speed	Altitude
31,650lb	700 miles	169 m.p.h.	8,000ft
28,700lb	1,000 miles	171 m.p.h.	8,000ft
21,800lb	1,600 miles	172 m.p.h.	8,000ft
12,900lb	2,465 miles	173 m.p.h.	8,000ft

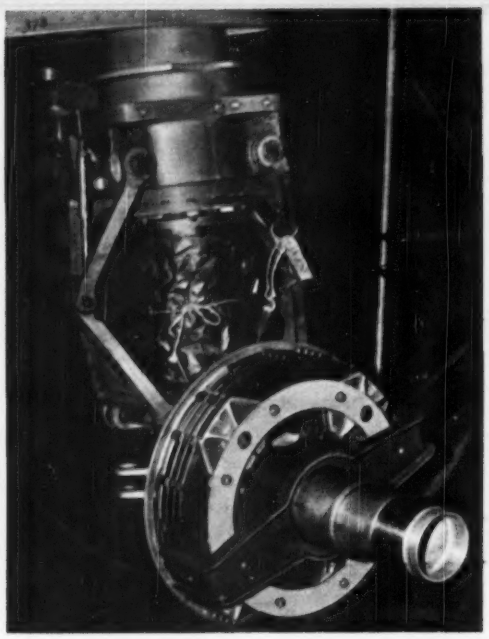
Loading Data

All-up weight	105,000lb
Max landing weight	100,000lb
Percentage structure weight	37.25
Wing loading	36.1 lb/sq ft
Power loading (T-O)	13.32 lb/h.p.
Passenger capacity	18 seats
cabin area and volume	237 sq ft and 910 cu ft
Toilets, etc.	77 sq ft and 410 cu ft
Baggage and mail	80 sq ft and 540 cu ft
Flight-deck	180 sq ft and 850 cu ft
Freight	360 sq ft and 3,600 cu ft

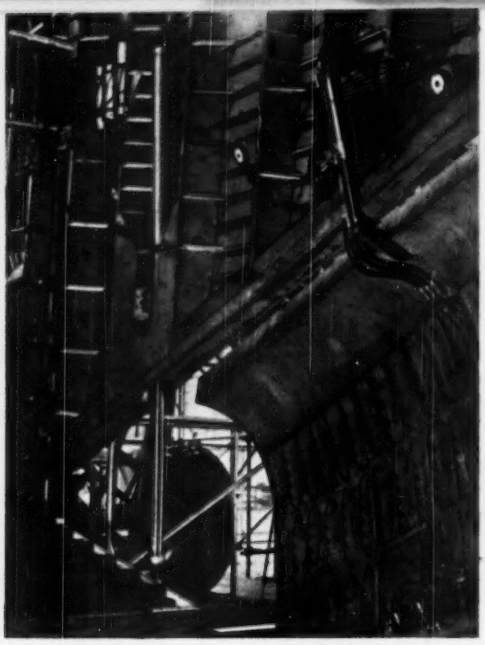
The very size of the Universal Freighter makes it difficult to show the structural detail; nevertheless, in this special cut-away drawing, our artist has succeeded in portraying not only the essential structural form of the aircraft, but also a very considerable amount of the airframe detail design.




DE-ICER DUCT
TRANSPORT JOINT
WING CRAWLWAY
No. 3 FUEL TANK (500 GAL)
No. 2 FUEL TANK (500 GAL)
No. 1 FUEL TANK (500 GAL)
DINGHY STOWAGE
JACKING POINT
FLAP MASTER ACTUATOR
DINGHY STOWAGE
FUEL JETTISON POINT (PORT)
RAMP OPERATING JACK
DOOR OPERATING JACK
RUDDER BOOSTER UNIT
ELEVATOR BOOSTER UNIT
OUTLET FROM DE-ICER DUCT
TOILET COMPARTMENT
TAIL DE-ICING COMBUSTION HEATERS
13, 14. INTAKES
(13, RETRACTABLE)
15. COMBUSTION EXHAUSTS
16. TAIL DUCT
A. BOWDLER



Detail of a main undercarriage unit showing sponson attachment, torque links and the four-cylinder plate-type wheel brakes.



Loading detail showing ramp and supporting jack, together with the starboard fairing door and its actuating and locking jacks.

UNIVERSAL FREIGHTER . . .

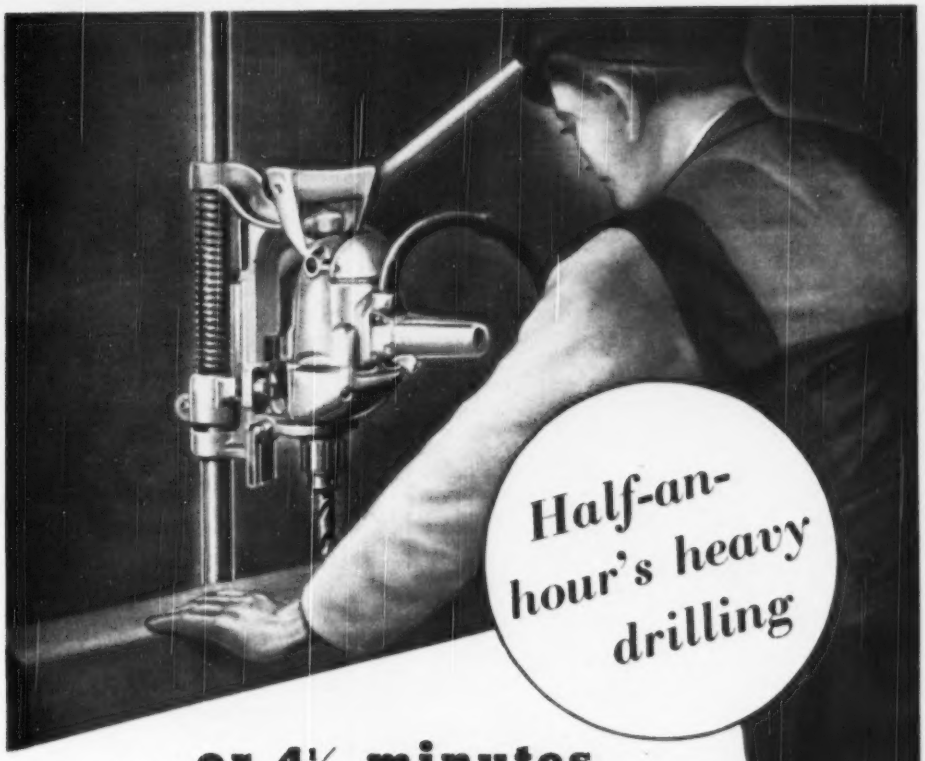
housed three "Radiation" surface combustion heaters, of which one 250,000 and one 450,000 B.Th.U. capacity unit jointly serve the anti-icing thermal duct in the leading-edge nose outboard of the outer engine, the remaining 250,000 B.Th.U. heater on each side being devoted to cabin heating, that to port serving the flight-deck and front half of the cargo-hold, whilst its starboard fellow serves the remainder of the fuselage interior. The leading edges of the tail surfaces are accorded ice protection in a similar fashion to the wings, the ducts being fed from a pair of combustion heaters carried in the tailboom. The anti-icing system is under the control of the radio operator and an ice detector is mounted immediately beneath the nose of the fuselage.

The power installation of the Universal Freighter comprises four Hercules 761 series engines in self-contained quickly detachable power-plants, a feature of which is the use of "free-exit" cowlings, designed to give improved cooling with reduced drag on aircraft of moderate speed performance. Unusually, the engine power-plant is mounted on a separately detachable bay which contains the accessory gear box, oil tank and oil coolers; this design permits the engine power-plant to be removed separately or, alternatively, the complete power installation unit may be detached as an entity. The modesty of the Universal Freighter's direct operating costs is in no small measure attributable to the excellent specific fuel consumption of 0.435 lb/b.h.p./hr which the Hercules gives under normal cruising conditions. Each engine drives a Rotol four-bladed airscrew of 14ft diameter which, in conjunction with the normal constant-speed feathering and reversing functions, also embodies electrical de-icing for the blades, current being provided from an individual 16 kW alternator on each engine. Graviner fire-suppression equipment is fitted in each nacelle.

On the outboard splay-rib of the inner-engine bay is mounted a massive compression member, to the base of which the crown of the undercarriage oleo-strut attaches with a spherical fitting. The telescopic shock-absorber struts are of Lockheed design and manufacture and are intended to cater for a vertical rate of descent of 12 ft/sec. Twin scissor links are used in conjuaction with the cantilever axle on which are mounted the Dunlop wheels incorporating that company's latest type of disc brake. Dunlop have also manufactured the 77in x 28.5in tyres which, incidentally, are the largest ever to have been made in this country. Undercarriage drag loads are accommodated by sponsons which, attached to the heels of the shock struts, are pin-jointed at the roots to forged fittings at the chine on the main frames of the cargo-hold.

The nose undercarriage comprises a Lockheed oleo-strut carrying two Dunlop 48in x 18in wheels and tyres, the strut being mounted in needle bearings in two split bearings in order to facilitate steering. With freedom of movement through a vertex angle of 120 deg, the nosewheel assembly is steered through a Lockheed jack and spring unit which also provides self-centring and shimmy damping. As already mentioned, steering is controlled only by the captain; a cable system from auxiliary pedals adjacent to the rudder pedals transmits steering motion to the hydraulic jack which, mounted athwartships beneath the nose compartment floor, picks up to the head of the nose strut. Power for steering is supplied from the aircraft's system (Lockheed) which, with an operating pressure of 2,500 lb/sq in, also powers the Fairey hydro-boosters used in the main flying control system.

Although actuation of the ventral doors and loading ramp is vested in hydraulic jacks—which are also Lockheed units—the system is entirely separate from the main aircraft hydraulics and, instead, a Turner duplex hand-pump is used to operate the jacks. The loading ramp is built in three sections, the foremost of which—11ft long by 9ft wide—is a stiff box-structure with a rounded under-surface, hinged at its leading edge to the cargo-floor, and embodying at its rear end a bearing pad which rests on the ground when the ramps are lowered. The remaining two sections of the ramp take the form of wedge "fingers," individually hinged to the ramp proper so as to cater for ground irregularities. The ramp jacks are universally pivoted in forged bearing blocks carried between pairs of reinforced wall-frames and are designed to act as locked hydraulic struts capable of carrying a load of 45,000 lb. By this means, the rear of the aircraft is supported, through the jacks and the ramp, despite the adverse moment about the main-wheels when loading or unloading items of great weight. When retracted for flight, the forward portion of the ramp closes the lower half of the ventral opening, the upper half and the ramp "fingers" being enclosed by the hinged fairing doors. In the retracted position, the ramps form a catwalk giving access up to the interior of the tailboom.



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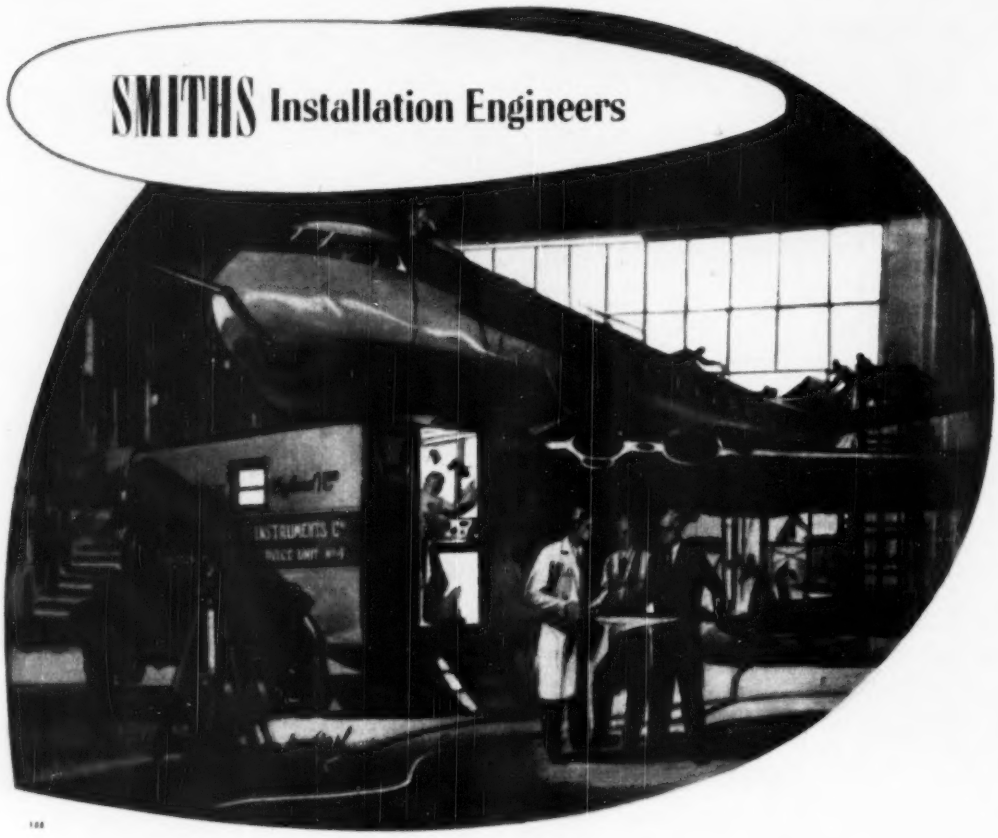
Smee 9

SMITHS Installation Engineers



Smiths team of Installation Engineers specialise in the installation of the Company's aviation products, which include the S.E.P.1. Auto-Pilot, a wide range of flight and engine instruments and various types of test equipment. From the drawing-board stage of a new project, these engineers have worked in close liaison with the aircraft constructor and have advised on the provision to be made for Smiths equipment. After the installation is completed they hold themselves available for general 'trouble-shooting'. When Smiths instruments are to be fitted to completed aircraft, the installation engineers advise on all structural alterations that the fitting may entail. Their services not only ensure the correct location and mounting of Smiths equipment but can —and often do—save aircraft constructors and operators considerable expenditure of time and money.

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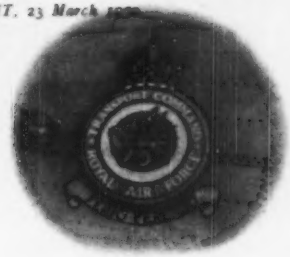


AFRICAN AIR LIFT

Native airfield workers refuel a Hastings at one of the African calling-points.

A Photographic Squadron's Trans-continental Move : Transport Command Lends a Hand

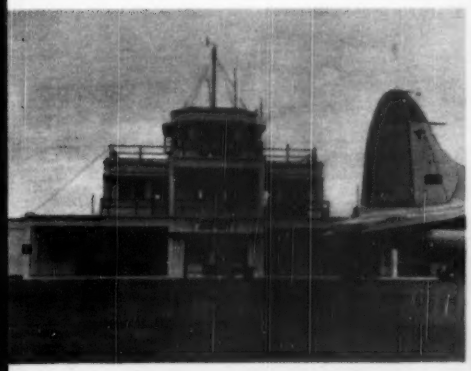
SINCE the winter of 1946, Lancasters of No. 82 (Photographic Survey) Squadron have been engaged in surveying, for the Colonial Office, several hundred thousand square miles of African territory. Between September and December last, the Squadron photographed nearly 30,000 square miles of Nigeria, the Gold Coast and Sierra Leone. In January, it became necessary for the unit to move eastward across the African continent, exchanging its humid base at Takoradi, on the Gold Coast, for the pleasanter surroundings of Nairobi, in Kenya.

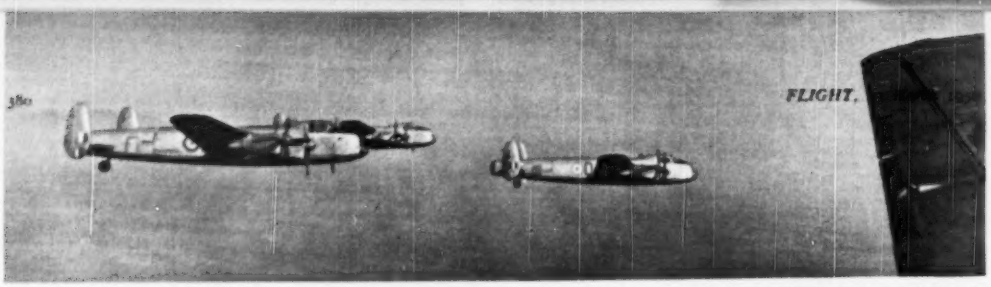
To solve the problem of moving some 18,000 lb of equipment and 85 ground personnel across Africa, Transport Command were called upon, and a flight of six Hastings, commanded by S/L. J. C. H. Cole, set off for Takoradi on January 7th from their base at Lyneham. The alternatives to air transport would, in this case, have involved a sea journey round the Cape or an arduous and lengthy road convoy. Some aspects of the subsequent air lift are seen on these pages.

Full use was made of space aboard the Hastings *en route* to the scene of operations. From Lyneham they carried an Army draft of normal replacement troops for West Africa, and a consignment of R.A.F. freight for Malta—the first calling-point. Later in the day the aircraft touched

No. 82 Squadron ground personnel go aboard at Takoradi.

(Below) The tower at Takoradi, with the tail of a civilian Dove intruding into the picture. Stalwart local police guarded the Hastings at Kano (centre). On the extreme right is the attractive entrance to Castel Benito R.A.F. Station, near Tripoli.





(Above) Pastures new: No. 82 Squadron Lancasters over East Africa. (Below) African assistance in refuelling a Hastings at Takoradi.

AFRICAN AIR LIFT . . .

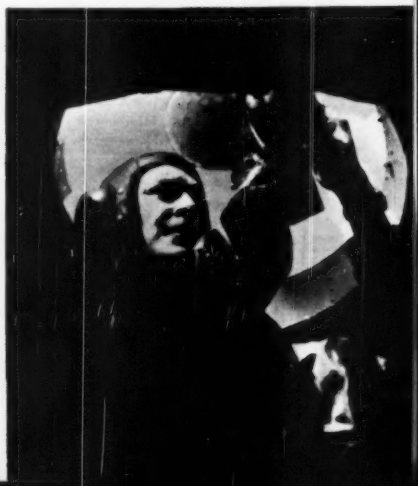
down at Castel Benito (Tripoli). Here crews and passengers were met by welcome cooked meals, and found time to don civilian clothes and spend a few hours in Tripoli.

The next stage—to Kano, Nigeria—was covered nonstop by night across the Sahara, to provide navigators with exercises in "astro." After a short break the flight carried on to Takoradi to begin "lifting."

Two load officers, one for each squadron, superintended the disposal of kit and equipment in the Hastings—from mess silver to survey cameras—and the transports and survey aircraft took off on the 3,668-mile journey to Nairobi. The trip was made in three stages—back to Kano, Kano-Khartoum, and on to Nairobi, where the Lancaster squadron settled into its new base. No. 82 Squadron is to continue surveying East Africa until the late spring of this year, when it will return to its parent unit at Benson, the Central Photographic Establishment.

The "removal squad," by contrast, began the flight back to this country almost immediately. The return journey was made *via* Aden, where time-expired airmen were picked up, and Malta. Within thirteen days of setting out, the Hastings were back at Lyneham. Shortly afterwards aircraft and crews were in service again on Transport Command's regular trunk routes to Singapore.

(Above, left) Officers of the Hastings squadron (left) and No. 82 squadron discuss problems of load control. Hastings crew members shown at work are (below, left to right Eng. Il Ginsberg, F/O. Blagden (pilot), F/L. Farmery (navigator) and (above) Nav. Il McKenzie.



The Power Plant of the Percival Prince

Alvis Leonides nine-cylinder, radial engines of 525/550 b.h.p., power the Percival Prince, the first aircraft in the world in its class to be granted a normal category Certificate of Airworthiness in full compliance with I.C.A.O. Transport Category 'A' Airworthiness Standards.

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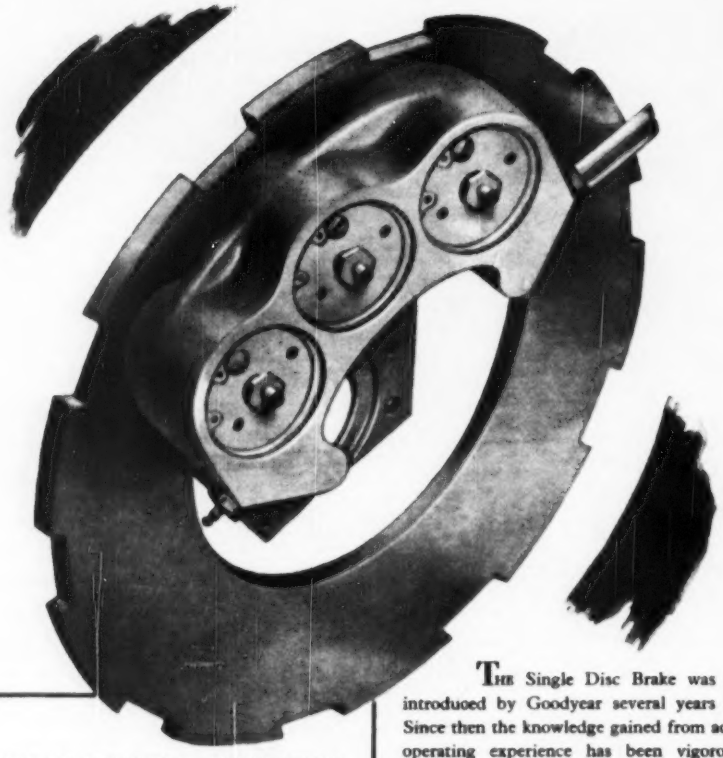

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★ UTMOST RELIABILITY ★

EXFERIMENT IN PAINT: With a view to improving the comfort of passengers in hot climates, the top surfaces of one of B.O.A.C's Argonauts have been experimentally painted white. The idea has already been adopted by several airlines in various parts of the world, and as described on this page, has also been incorporated in the Vickers Viscount.

VISCOUNT GOES ABROAD

THOUGH *Flight* representatives have previously been privileged to fly in—and pilot—the Vickers Viscount, and have described their impressions (issues of December 30th, 1948, August 25th, 1949), the experience is always such a pleasant one that we were glad to take advantage of a further opportunity when the aircraft made a series of short flights at Wisley airfield last Friday. Although the weather was by no means conducive to smooth flying, above the overcast the Viscount gave its passengers a comfortable, quiet ride.

Now resplendent in its B.E.A. colours and interior decoration, G-AHRF has the upper third of the fuselage exterior painted white, which will have the effect of reducing cabin temperature very considerably in extremes of heat.

In an informal talk to passengers after the flights, Mr. G. R. Edwards, chief designer, enumerated some of the finer points of turboprop economics and traced the Viscount's development. He mentioned, also, further development of an interesting item of the Viscount's equipment—the use of "automatic braking" that has nothing to do with wheels and only a remote connection with airscrew-reversing. When the weight of the aircraft comes on the undercarriage during landing, a micro-switch closes a circuit which allows the airscrew blades to revert to extra-fine pitch; the effect of the increased drag is said to shorten the run by 150 yards.

On Monday, March 20th, Lord Douglas of Kirtleside (chairman of B.E.A.) and a number of well-wishers gave the Viscount an auspicious send-off at Northolt for its flight to Amsterdam on the first leg of the European tour. Details of the route to be followed were given in *Flight* of March 9th. The Viscount is piloted on the tour by Captain W. Wakelin, of B.E.A., who is the second pilot in the world to have his licence endorsed for turboprop-powered aircraft. Vickers' chief test-pilot, Mr. "Mutt" Summers, is flying as second pilot. Among the passengers are Sir Hew Kilner (deputy chairman and managing director (aviation), Vickers-Armstrongs, Ltd.) and Lady Kilner, Mr. G. R. Edwards, chief designer, Mr. Robert Handasyde, sales manager, and Mr. Peter Masefield, chief executive of B.E.A.

SCOTTISH MARINE BASES

THE Greenock Harbour Trust is reported to be seeking renewal of the licence for its marine base in the Firth of Clyde. As reported in *Flight* of March 2nd, the Leith Dock Committee, whose site for the proposed flying-boat base is now ready for inspection, has also sent an application to the M.C.A.

These steps are believed to arise from a provisional grant of a licence to Aquila Airways, Ltd., to operate flying-boat services from Falmouth to Glasgow, Edinburgh, Belfast, Southampton and the Scilly Isles under an associate agreement with B.E.A. It is stated that although the licence mentions Glasgow, the idea is that flying-boats will use a landing area opposite Prince's Pier at Greenock.

THE BRACKLEY TROPHY

AT a cocktail party held at Londonderry House on March 15th and attended by a distinguished gathering of pioneers of British aviation, a trophy of unique design was presented to the Guild of Air Pilots and Navigators for annual award.

Known as the Brackley Memorial Trophy, and donated by Mrs. H. G. Brackley, it commemorates the late A.Cdre. H. G. Brackley, C.B.E., D.S.C., D.S.O., who was one of Britain's leading authorities on flying-boat operation. Appropriately, it is to be awarded annually to a British subject, within the Empire, "for the most outstanding achievement concerning improvement in the operation of flying-boats." This contribution may be either theoretical or practical, and must be related to the organization, flying or navigation of flying boats or services, but not to their design or construction.

The first recipient selected by the Court of G.A.P.A.N. is Mr. John Lankester Parker, O.B.E., F.R.Ae.S., chief test pilot of Short Brothers from 1916-1945, and now a director of Short Brothers and Harland, Ltd. The award marks the recognition of his test flying and development, over many years, of seaplanes and flying-boats, which include the Empire

MARINE MEMORIAL: The exquisitely worked Brackley Trophy referred to on this page took nine months to complete. It was the work of one of England's leading silversmiths, Mr. H. J. Brown of Norwich. To ensure accuracy in sculpture, Mr. Brown enlisted the aid of bird-watchers in the area near the late A.Cdre. Brackley's home in Norfolk.

CIVIL AVIATION NEWS . . .

"C" class, Sunderland, Shetland, Sarafand, Mayo-Composite, Singapore, Calcutta and Kent types.

The trophy itself, perfectly executed in silver, is a sea-bird with outspread wings poised on the curl of a large, concave, scalloped sea-shell and mounted on three sea-horses. Symbolic of the sea and of flight, the common tern was chosen as a model because it was a familiar sight at the late A. Cdre. Brackley's residence at Blakeney, Norfolk. The names of the holders will be recorded on a silver-faced plaque.

UNITED KINGDOM AIRPORTS IN NOVEMBER

Airfield	Aircraft Movements			Passengers (terminal and transit)	Freight (lb)
	Air Transport	Other Flights	Total		
Aberdeen (Dyce)	160	755	923	1,115	20,235
Belfast (Nutts Corner)	398	44	442	4,765	101,195
Birmingham (Elmdon)	159	396	555	887	26,481
Blackbushe	180	1,203	1,383	2,340	257,597
Blackpool (Squires Gate)	219	350	569	504	22,557
Bovingdon	59	870	929	532	107,180
Bristol (Whitchurch)	7	804	811	16	—
Cardiff (Pengam Moors)	30	1,157	1,187	62	160
Croydon	164	427	591	275	95,6467
Edinburgh (Turnhouse)	185	1,181	1,366	1,305	2,0277
Gatwick	20	373	393	54	362
Glasgow (Renfrew)	758	304	1,062	6,168	60,646
Hurn	85	2,345	2,430	1,159	89,648
Isle of Man (Ronaldsway)	505	147	652	2,878	35,834
Inverness (Dalcross)	159	79	238	610	3,901
Kirkwall	265	66	331	1,317	15,005
Leeds (Yeadon)	33	412	445	38	—
Liverpool (Speke)	404	336	740	3,589	89,083
London	1,583	434	2,017	25,503	1,544,738
Lympne	37	256	293	74	65,643
Manchester (Ringway)	633	461	1,094	3,337	280,957
Northolt	2,480	661	3,141	33,119	1,141,890
Nottingham (Tollerton)	—	513	513	—	—
Prestwick	488	352	840	6,9.3	70,680
Shoreham	—	262	262	—	—
Southampton (Eastleigh)	221	1,478	1,699	1,355	26,496
SouthamptonWater	67	123	190	1,388	68,249
Weston-Super-Mare	2	163	165	5	—
Wick	292	38	330	568	615
Other Aerodromes	702	238	940	3,131	48,707
All Reporting Airfields	10,303	16,238	26,531	102,997	4,185,535

ACTIVITIES at United Kingdom airports during November, 1949, included the handling of more than 100,000 passengers. Of this number, only 10,000 were in transit. Northolt accounted for 33,000 and London Airport for 25,500, while Prestwick was again the third busiest passenger-handling airport. Normal freight was heaviest at London (690 tons), which, together with Northolt (510 tons), accounted for approximately two-thirds of the total freight at all airports. Some 26,500 aircraft movements were reported, of which 10,300 were departures or arrivals on air-transport freights. Detailed figures for the larger airfields are given above.

BY APPOINTMENT: Although possessing his own Dakota, the King of Greece often travels in aircraft of T.A.E. (Greek Airlines) when visiting outlying parts of his kingdom.

SOUTH AFRICAN AIRWAYS

THE appointment of an independent commission to investigate and advise on the best possible airways system in South Africa is urged by a leading article in the *Cape Argus*. The paper expresses concern at the operations of the State-owned South African Airways (a subsidiary of the Railways administration), which, it claims, is not operating at maximum efficiency. It points out that while the airline remains under the direct control of the railways it is unlikely to be given a free hand to compete with them. The case of the Skymaster service between Capetown and Johannesburg is cited; it is alleged that this service is not operating at full capacity "because the administration makes no attempt to attract air-freight for fear that it will hurt the railways."

The article continues, ". . . some at least of the existing overseas airways would be prepared to offer travel to Europe at half the present rates in 'high-density' aircraft but for restrictions imposed by S.A.A." It points out that in spite of the fact that most of the larger privately owned companies are reporting big improvements in their financial position, S.A.A. has indicated that there will be no profit this year. Last year a profit of £379,000 was declared, and, in the previous year, one of £401,000. Bearing in mind that in October, 1949, S.A.A. showed a loss of £155,000, the aviation journal *Wings* deplores the present policy of reducing internal services, upon which the company is apparently losing money.

It will be recalled that, as mentioned in *Flight* of March 9th, South African Airways have recently withdrawn all Lodestars to reduce the number of flights and decrease petrol consumption on internal services. On the other hand, the delivery of four Constellations, now on order, is expected shortly; the aircraft will be used on the Johannesburg-London route.

QUESTIONS IN THE HOUSE

THE much-discussed subject of the future of flying-boats was recently raised in the House of Commons when the Parliamentary Secretary of the M.C.A., Mr. Beswick, was questioned on the withdrawal of Solents from service with B.O.A.C. and on the proposed closing of the Southampton base. In his reply he stated that there was no overriding national interest which would lead the Minister of Civil Aviation to request the Corporation to reconsider its decision. It was intended, he said, that Southampton Marine Base should be kept on a "care and maintenance" basis unless some other interim use could be found for it.

Mr. R. Morley (Labour, Southampton Itchen) asked the Parliamentary Secretary if he was aware that many people preferred to travel by flying-boat, and that if they were compelled to travel by landplane to South Africa they might elect to travel by Sabena or K.L.M. in view of the fact that these services were faster than those planned for B.O.A.C.'s Hermes. He also pointed out that millions of pounds had been spent at Southampton, Singapore and Karachi on the construction of flying-boat bases, and deplored the evident waste of all this money. In reply, Mr. Beswick said that the decision had been taken simply because it was proposed to curtail the losses that had been incurred, but as far as the earlier question was concerned, he could not accept the implication in either part.

The Minister was asked by another Member if he was aware that the Solent boats had not been given a proper chance because they had never been operated at full capacity, and that the feeling of the people in the industry was that landplane interests were prejudicing discussions on this very vital matter. Sir Peter Macdonald (Conservative M.P. for the Isle of Wight): "Will the Parliamentary Secretary make an investigation into the nationalized air corporation which is responsible for the operation of these flying-boats? If he does, he will find that there is distinct prejudice against flying-boats. We know who they are and we shall see that they are cleared out, because we are going to have flying-boats in this country whether the Americans want them or not."

While the exact import of his assertion is not, perhaps, self-evident, it is nevertheless obvious that Sir Peter Macdonald

is a staunch supporter of the cause. The fear that flying-boats may shortly vanish for ever from commercial operations was, however, somewhat alleviated by Mr. Beswick's subsequent statement that there was nothing about the present decision which would prejudice the use of the bigger boats now under construction.

AUSTRALIAN COMMUNICATIONS

THE sum of approximately £200,000 has been allocated by the Australian Government to pay for large-scale improvements in the existing air-to-ground communication systems. Most of the H.F. transmitters are to be replaced, and when the work is completed there will be 140 V.H.F. stations along the Australian and New Guinea routes.

The limited number of channels which were available in the 3 to 12 mc/s band had rendered the service inefficient. The present system, in fact, is now unable to cope with the traffic demands. New frequencies will be between 118 and 132 mc/s, and will be used for airfield and approach control and international distress channels. At present all DC-4s, DC-6s, Convairs and a number of DC-3s on domestic routes and almost all the aircraft operating international routes, are equipped with V.H.F. Good progress is also reported with the fitting of this equipment in all domestic aircraft. The total requirements are for 205 transmitters and receivers with associated aerials and transmission lines; all of this equipment will be made in Australia. Stand-by equipment will be used to provide a service in the event of a failure in the V.H.F. sets.

BREVITIES

THE Minister of Civil Aviation, Lord Pakenham, has appointed Sir William MacNair, K.C., to hold a public court of inquiry into the accident to the Tudor V which occurred at Llandow on March 12th. It is expected that the inquiry will be held in South Wales.

* * *

The volume of enquiries on the British charter market for tourist flights during the summer is so great that many operators—whose fleets cannot profitably be expanded in view of the seasonal fluctuations—are already having to turn down offers for this period.

* * *

In the 1950-51 Air Estimates (see page 367) the sum of £270,000 is quoted for the charter of civil aircraft for anti-aircraft practice. This is an increase of £120,000 over the sum spent in 1949.

* * *

Traffic statistics for Australian National Airways in 1949 show an overall decrease in all activities with the exception of the carriage of freight. Passenger-mileage decreased by some 20 million to 271,280,436 last year, while the total number of passengers carried fell by some 20,000. Freight, on the other hand, showed an increase of over 12,000,000 lb.

* * *

The Lebanese Government has authorized the creation of a new aviation company to be known as Société des Lignes Aériennes pour le Moyen-Orient (Middle-East Air Lines). Subscribed capital is to be 12,500 shares of £L100 each. P.A.W.A. will participate financially to the extent of 36 per cent, but the company will remain under local administrative and operational control.

* * *

Nine flights per week *via* Prestwick will be flown between New York and points in Europe by Scandinavian Airlines System for the summer season (May 15th to October 1st). Four of these services are routed *via* Copenhagen to connect with flights to Africa and the Far East. At Prestwick, connections are available to London, Paris, Amsterdam and points in Germany.

* * *

The American Air Line Pilots' Association is at present conducting tests in a DC-4 under various climatic conditions, to establish the adequacy of the present "T" category operations requirements. The tests should, in addition, provide valuable data (with particular reference to maximum gross weight limitations) for aeronautical designers and airline operations departments.

* * *

Kalang Airport near Singapore has been opened to receive Constellations on a trial basis. Previously the runways were not considered capable of supporting such weighty aircraft. Congestion at the neighbouring airport of Tengah will thus be considerably relieved, and further advantage will accrue from the fact that Kalang is much nearer the business centre of Singapore. The first flight of Constellations from Kalang will be on the Jakarta to Europe route operated by K.L.M.

* * *

The Baumann Aircraft Corporation reaffirms the fact that, contrary to general belief, it has not sold complete design rights and equipment of the Brigadier to the Piper Aircraft Corporation. The transaction over which this misunderstanding appears to have arisen was merely a sale of the first prototype to expedite development of a twin-engined tractor-type aircraft upon which the Piper factory is engaged. Baumann announces that assembly of the first production Brigadier is progressing rapidly and that the aircraft should, in fact, make its first flight in the early summer. The prototype first flew in 1947.

The B.O.A.C. Argonaut engaged on a trade flight to South America, which left London airport on February 20th, reached Santiago last week. Along the route 20 demonstration flights were made and 625 passengers were able to form impressions of the aircraft in the air.

* * *

The growing importance of Curacao's main airport at Hato has necessitated construction of a new 2,500yd runway. Last year's arrival traffic included some 3,461 K.L.M. aircraft, 2,069 from Pan American, and 290 from B.W.I.A. There is a weekly K.L.M. service from Curacao to Holland, *via* Dakar, Lisbon and Madrid, as well as two weekly services *via* Montreal and New York.

* * *

Both Sabena and K.L.M. have decided to re-route their Brussels-Hamburg services to call at Hanover during the period (March 29th-April 2nd) of the Hanover Fair, one of the most important of the trade exhibitions held annually on the Continent.

* * *

On April 1st, T.A.E. (Greek Airlines) will start to operate international services between Athens and Instanbul and Athens and Marseilles *via* Rome. Two services will be flown weekly. The company is also flying twice-weekly services to Alexandria. Within Greece, T.A.E. makes some 112 flights weekly.

* * *

In *Notice to Licensed Aircraft Engineers and Owners, No. 34*, the A.R.B. announces that recent investigations into the cause of structural failures in two Proctors will necessitate a modification reinforcing the centre-section spars of all Proctor IVs and Vs. Certificates of Airworthiness will not be renewed unless the aircraft have been modified, and the laminated spar booms inspected, by March 31st.

* * *

The second prototype Ambassador was slightly damaged while taking off on March 13th at Hurn Airport. During a simulated engine-failure test with the starboard throttle closed and the wheels braked for retraction, the undercarriage touched a hump on the runway and the consequent deceleration caused the aircraft to sink back. Damage was restricted to the underside of the fuselage and to the port airscrew.

* * *

The Government of New Zealand has approved an allocation of £2,800,000 for the projected airport at Rongotai, two miles from the centre of Wellington. The present terminal is 30 miles north of the city, and passengers have constantly complained of the delays caused by the lengthy road journey. The airport will have a 1,440-yd runway and provide all-weather landing facilities.

* * *

So great has been the demand for Easter air passages to Paris, the Channel Islands and other holiday centres that B.E.A. has already scheduled more than 100 extra flights between April 5th and April 12th. As usual, services to Paris are predominant, no fewer than 40 flights at present being listed for April 6th. It is thought that even more may have to be added before the day arrives.

* * *

Air France announces that, as a result of last year's I.A.T.A. conference in Mexico City at which the world-wide system of fares was reviewed, considerable reductions have been made in the rates from the United Kingdom to North Africa. The new fares, which came into force on March 22nd, are London-Tunis, £25 10s instead of £35 6s; and London-Algiers, £24 10s (£32 8s). Comparable reductions have been made for the services from Birmingham, Manchester, Glasgow and Belfast

ROME—IN A DAY (continued from page 366)

we crossed Italy's northern border, were 256 kt I.A.S.; −35 deg C; Mach Number = 0.72; course 327 deg M. Engine sounds were very remote in the cockpit, and all was uncannily smooth for such terrific speed.

It was about this time that we had a most magnificent view of the snow-covered Alpine ranges below. The bright sunshine intensified the glistening whiteness and the deep shadows in some of the valleys. From more than 30,000ft one could make out very little detail of road or railway, but an occasional river could be distinguished, and towns as a whole could be picked out as a cluster of dots and lines.

Our highest ground speed was recorded at about 16.35 hr, shortly after leaving an area over the high mountains, where small, sharp bumps had occasionally been felt. Thanks to a favourable wind we achieved an average of 580 m.p.h. over ground for a period.

The roughest patch we experienced at high altitude came at about this time, but it was certainly no more than is experienced regularly on airlines, and because the effect of the bumps was quite sharp and quick there was no sickening feeling or discomfort. The captain climbed 2,000ft to about 34,500ft to clear the area (16.40 hr; 9,400 r.p.m.; 268 kt I.A.S.; −34 deg C; M = 0.75). This was the highest altitude we reached on outward or return flights. On previous occasions the Comet has been taken to a maximum of 46,000ft. When the pressurization equipment has been fully developed and tested, well over 40,000ft will be quite comfortable for passengers, although 40,000ft will probably not be exceeded on normal services. Incidentally, the Comet has also attained a Mach Number of 0.84 without any unusual feeling on the controls. C. of A. limitations for service will probably be 0.8, or 350 kt.

By 16.50 hr we were over the Dijon area with only ⅛th of cloud below and making good about 565 m.p.h. ground speed (M = 0.75 on the meter). The screen pillars were white with frost inside the cockpit, and particles of snow occasionally fell from the roof. The air was comfortable, warm and fresh. A British aircraft could be heard calling Orly.

In the cabin we looked through a presentation album of photos inscribed and captioned, and depicting the landing, welcome and refuelling of the Comet in Rome an hour or two earlier; Esso photographic services had matched the speed of the Comet. At 17.03 we were 45 nautical miles east of Paris.

For a while only cloud could be seen below, but as we approached the French Channel coast breaks appeared and Le Touquet could be picked out below. Waves like ripples were clearly visible as we made a five-minute crossing of the Channel to Dungeness, which, sharply defined, pointed towards us. Our E.T.A. was estimated as 17.33 hr and the long descent was started. London had been contacted some minutes earlier but London Radar had not so far reported picking up the Comet.

The Metropolis we could see to be cloud-covered, but the surrounding area was clearer. The Isle of Sheppey stood out to the east.

The descent at 3,000 ft/min, much like that into Rome, was remarkably smooth until we reached cloud-level over North London. The time was 17.28 hr, the height 5,000ft. I looked out across the great expanse of wing with its characteristic shape, and watched the outer portion flex, damping out the bumps as it were, while we raced through broken cloud towards the airfield.

Within a minute or so of two hours since take-off, the Comet again flashed over a waiting crowd, and circled in the grey evening light to land in the blustering cross-wind.

Thus was concluded another "test flight to check fuel consumption," and de Havilland's four-jet airliner was soon being towed into its hangar to await the next morning's light before starting another full day's development flying.

We passengers answered the usual questions in the usual way—"Yes, it has been a remarkable experience." "No, there has been no bother at all." "Every minute has been enjoyable," and so on. These everyday answers conveyed little of what most of us really felt, but were unable to express. Perhaps the flight had outdistanced by a little our powers to absorb and appreciate the wonderful events of only eight daylight hours.

RECORD DATA

Preliminary figures for the out and return flights, subject to confirmation and possibly correction, are as follows:—

Take-off from Hatfield	09.14 hr 42 sec
Time of landing at Ciampino	11.17 hr 34 sec
Time of flight	2 hr 2 min 52 sec
Distance between airfields	915.86 statute miles (1473.866 km)
Speed	447.246 m.p.h.
Equivalent capital-to-capital time (London to Rome)	1 hr 59 min 37 sec
City-to-city distance	891.67 statute miles (1434.934 km)
Take-off from Ciampino	15.30 hr 45 sec
Time of landing at Hatfield	17.34 hr 59 sec
Time of flight	2 hr 4 min 14 sec
Speed	442.32 m.p.h.
Equivalent capital-to-capital time (Rome to London)	2 hr 0 min 57 sec

Wind strength and direction were very variable but, generally speaking, the effects cancelled out. The strongest headwind encountered was one of 60 kt.

THE COMET'S COMPLEMENT

Crew.—John Cunningham, D.S.O., D.F.C. (pilot), Peter Bugge (co-pilot), George Blackett (navigator), Brackstone Brown (flight engineer), J. E. Marshall (flight-instrument engineer).

Passengers.—Sir Archibald Rowlands, G.C.B., M.B.E. (Permanent Secretary to the Ministry of Supply), Air Marshal Sir Alec Coryton, K.C.B., K.B.E., M.V.O., D.F.C. (Controller of Supplies (Air), Ministry of Supply), F. C. Musgrave, C.B. (Under-Secretary (Air), Ministry of Supply), Maj. John B. Mullock, M.C., D.F.C., Maj. Oliver Stewart, M.C., A.F.C. (Editor of *Aeronautics*), Thurstan James (Editor of *The Aeroplane*), Maurice A. Smith (Editor of *Flight*), F. E. N. St. Barbe (sales director, de Havilland Aircraft Co., Ltd.), Hugh Buckingham (director, de Havilland Engine Co., Ltd.), Frank Lloyd (commercial sales manager, de Havilland Aircraft Co., Ltd.), Martin Sharp (public relations manager, de Havilland Aircraft Co., Ltd.).

On the return flight the Italian air attaché in London, Col. Fanali, was carried, together with three D.H. pilots who had previously flown Vampires to Cairo: J. W. Wilson, G. F. Thornton, W. R. Beaumont.

MR. CHURCHILL ON AIR POWER

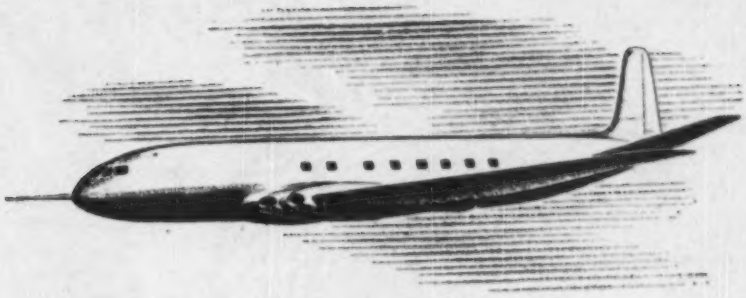
SOME trenchant observations on current British air-defence policy, expressed by the Leader of the Opposition, characterized last Thursday's Commons debate on the Defence Estimates. After Mr. Shinwell (Minister of Defence) had reviewed the Estimates—so far as the R.A.F. was concerned, his comments were very much on the lines of the Air Minister's memorandum summarized on p. 367 of this issue—Mr. Churchill put forward the Opposition view. After dealing with the broader political implications he proceeded to discuss naval strategy, and in the course of these remarks he strongly advocated that our naval effort should be directed towards creating the largest numbers of light fleet aircraft-carriers and auxiliary carriers which were capable of carrying the necessary modern types of aircraft.

An intensive effort, he said, should be made to improve methods of submarine detection from the air, and in this connection he quoted the recently released American information on the "Schnorkel-spotting" P2-V4 Neptune. "I have not read anything so encouraging or hopeful for many a long day," said Mr. Churchill, "and I am astonished that more information should not have been volunteered by the Minister of Defence."

Passing on to what he termed "the general air problem," Mr. Churchill said that in the forefront stood the enormous numerical strength of the Soviet Air Force. If we wished to have that strength which would deter war or, if the worst came to the worst, enable us to win through, we required far larger numbers of the highest class aircraft than we now possessed. Every sacrifice should be made in other branches of defence to make sure that that is not neglected. Providentially, there was the American Air Force, which was far stronger than ours and of equal quality.

Speaking of our jet-fighter strength, Mr. Churchill questioned the wisdom of exporting these aircraft to countries such as Argentina. "The Royal Air Force lays before us estimates for £223m.," he said, "yet to gain little more than £2m. of foreign exchange . . . . 100 of these vital instruments have been sent away. The wise use of our jet aircraft would have enabled the whole of the Auxiliary Air Force squadrons to be effectively rearmed."

To this Mr. Attlee later replied, saying that we could not afford to buy all the jet aircraft produced by the industry. It had been planned to keep a war policy in case of need to have rapid expansion. They had been sold abroad to our allies in the Commonwealth or foreign countries. Some had been sold elsewhere, but it did not mean there had been any weakening of our air force. The sale of jet aircraft to Argentina could be justified; there was need for war potential and exports.



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AMERICAN NOTEBOOK

By
Stanley H. Evans
F.R.Ae.S., A.F.I.Ae.S.

BON-AVION

A LITTLE healthy competition is not only good for trade, it is also the spark-plug that starts the designer doodling on his sketch-pad—or a nice clean table-cloth. (Many an inspired design, we suspect, has been lost in the limbo of the waste-paper basket or the wash.) In the personal aircraft field this sort of healthy rivalry has done much to improve the breed, and during the past year or so it has touched off an interesting controversy between owners of the Beech Bonanza and the Ryan Navion, the acknowledged American leaders in the low-wing four-seater class. Several private performance contests have been staged for the "Bon-Avion Stakes," followed by the usual partisan claims.

Both designs are highly developed from an engineering viewpoint and are closely competitive in size, capacity, configuration, power and price. At the moment, the Navion De Luxe 205 model seems to have jumped into a slight lead over the Bonanza Model 35 from the standpoint of take-off performance, the initial climbs being 950 and 890 ft/min respectively. But the Bonanza shows up better on level speed, having top and cruising values of 184 and 170 m.p.h. against the corresponding 163 and 155 m.p.h. of the Navion. It might also be added that the Navion De Luxe 205 is equipped with the later type Continental E-185-3 engine which delivers a take-off power of 205 h.p. at 2,600 r.p.m., while we believe the Bonanza 35 is still fitted with the earlier E-185-1 engine giving a take-off power of 185 h.p. at 2,300 r.p.m. [The latest Model 35 specification on our files lists the E-185-8 engine of 196 take-off h.p.—Ed.]

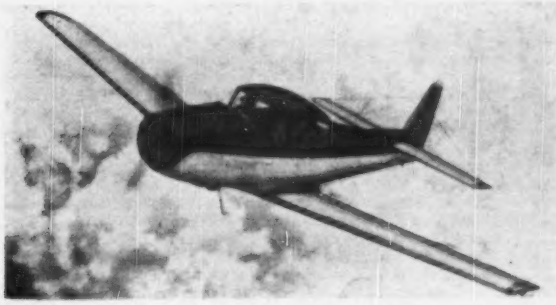
Externally, and therefore aerodynamically, the Bonanza looks the cleaner of the two, particularly as regards the wing design—which is of prime importance to all the little horses under the engine cowl, as well as all the little air particles trying to slip by without getting too badly bruised. The Navion wing, for example, looks clean enough on its top surface, but an "outstanding" feature of the underside is the row of external flap and aileron hinge-brackets, the design object of which is to produce the required slot geometry and flap deflection. This kind of drag has been aptly labelled "parasite," since it can never pay for its board or lodging and, moreover, there is really no necessity to subsidize such hangers-on.

We have purposely stressed this point because actually a neat and practical solution, with powerful slot action, can be readily obtained by locating the hinge-pin close to or flush with the lower surface, thereby eliminating clumsy-looking external brackets mounted proudly in the breeze. Furthermore, should the maximum slot boost be sought, the optimum slot opening and flap deflection can still be obtained by means of a simple parallel-type of control linkage completely submerged within the wing profile. Credit for the latter solution is due to Dr. Lachmann, of Handley Page, and it is a bit surprising that such a simple mechanism seems to have escaped at least a trial by American designers.

The 1950 Ryan Navion De Luxe 205 four-seater, with Continental E-185-3 flat-six engine, sells for just under $11,000 (£3,900). This model is competitive with the Beech Bonanza B-35.

One or two other minor externals contribute their quota to the Bonanza's speed superiority; e.g., the cleaner fuselage lines (with neat retractable doorstep) and the slightly lower overall drag of the butterfly tail unit. The Navion fuselage suffers, we think, from the absence of a prop spinner, the existence of a fixed step for ingress to the cabin, and the broken fuselage dorsal caused by the raised-type canopy. On the other hand, this type of canopy may have certain practical advantages resulting from the better all-round view and be well worth the loss of a mile or two on the cruising speed. (Personally speaking, despite our inherent kindness to air particles, we would always settle for the better view.) As for the V-tail, although Beech are to be congratulated on rescuing it from the archives of the Old World (it was pioneered, as we recall, by Rudlicki in France, *circa* 1930), there is probably not a great deal of aerodynamic advantage in the scheme; nevertheless, it does reduce the number of structural assemblies and, therefore, should be a bit cheaper to fabricate.

From the viewpoint of riding comfort in the air, our Ryan friends may have a nice sales-point with their patented selective two-control co-ordinating system, which was introduced last year for those who are prepared to pay a bit extra for putting their feet up on the dash once they get well into the air. The basic principle is a spring-interconnected aileron and rudder control which permits turning on the wheel only, or choosing the orthodox three-control system by merely pressing on the rudder pedals in the ordinary way. It thus provides the control advantages of the Ercoupe two-control system, while permitting the full and independent use



A more powerful version of the Navion, known as the Super 260, has recently been announced. With a Lycoming GO-435-C2 geared flat-six engine, it is to sell for about $14,000 (£5,000).

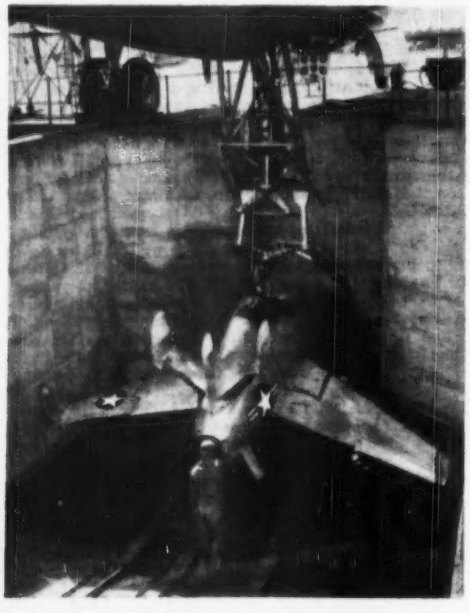
AMERICAN NOTEBOOK : : :

of the rudder for take-offs and landings from rough pastures and in cross-winds. We have been told by an engineering pilot who has flown it that the Ryan two-control operation is good up to angles of bank of 30 degrees or so.

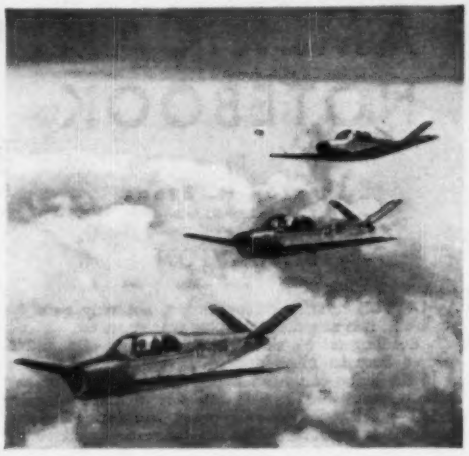
Scheduled for a debut in this month, a faster, more powerful Super 260 Navion is now shaping up on the assembly line at San Diego. (The flight test model has been in the air for several months.) It is powered by the new geared Lycoming GO-435-C2 flat-six engine normally rated at 240 h.p. at 3,000 r.p.m., and developing 260 h.p. at 3,400 r.p.m. for take-off. Externally, the Super 260 is very similar to the De Luxe 205 model, except for a nose three inches longer, slightly different cowl lines, and a larger-diameter, more efficient, slower-running airscrew. The latter, incidentally, ought to result in a lower sound-level inside the cabin.

A cruising speed of 170 m.p.h. will now match that of the 1950 Bonanza B-35 model, while the initial climb off the ground has been upped to 1,250 ft/min and the take-off over a 50ft obstacle reduced to 770ft. The service ceiling is 18,000ft as against the Bonanza's 17,100ft. Normal cruising range (with a 20-gal auxiliary tank included at no extra cost) is 640 miles, as against a quoted figure of 750 miles for its chief rival. Optimum range, however, for the Navion 260 can be extended to 900 miles under economy cruise-control conditions—which means at a lower cruising speed, of course.

It is planned to sell the Super 260 model for around $14,000 (about £5,000), completely equipped, which is some $3,000 more than the price of the De Luxe 205. The Bonanza, incidentally, also sells for around $11,000 (rather under £4,000), in competition with the De Luxe Navion. Ryan have recently added a third member to the Navion family line, known as the Utility 205 model, selling for approximately $9,500 (£3,320). It has the same engine, airframe, radio equipment and external finish as the De Luxe model, but the accessories, instruments and interior furnishings are less elaborate.



Lesser Flea: Some idea of the complex trapeze structure needed for launching and retrieving of parasite escort fighters is exemplified by this view of the McDonnell XF-85 Goblin, seen here suspended from the bomb-bay of a Boeing B-29.



The Beech Bonanza, three of which are seen here, has been followed by an improved model known as the B.35. A Beech electrically controlled airscrew is fitted, and there have been interior improvements. Orders for over 100 are announced.

Both the Bonanza and the Navion can be accepted as highly developed specimens of the personal aircraft designer's art, exhibiting the well-established engineering formula of year-by-year refinement rather than radical change—a concrete illustration, in fact, of the survival of the fittest. Their survival, indeed, has fared better than the attempted post-war revival of the unorthodox, but more logical, tail-end pusher concept seen in the Douglas Cloudster and the Planet Satellite. But notwithstanding the excellence of the present conventional pattern, it is highly probable that this particular branch of the evolutionary road is nearing its end, for one look at the intriguing little French Fouga Cyclone plainly signposts the direction in which the doodle-bug artists are heading.

A little preliminary doodling and slide-ruling soon indicates that a pair of Turbomeca Piméné jet units buried in the wing roots can offer a big improvement over the prancing piston and whirling windmill in front of one's face. It doesn't take much imagination to visualize all the airmarks of an elegant-looking (and performing) four-seater with a clear view in all directions—as we hope to show by subsequent design-studies. The twin-engined bonavion for the jet age is clearly in sight—on paper at any rate—and the most significant step of all is that the more difficult turboprop stage has been completely side-stepped.

SONG OF THE FLEA

So, Naturalists observe, a flea
Hath smaller fleas that on him prey;
And these have smaller fleas to bite 'em,
And so proceed ad infinitum.

(Dean Swift, 1733.)

Word from Washington says that Defence officials believe that U.S. atomic-bomber strength has been sharply increased by recent additions to the Strategic Air Command. The number of B-29 bombers has been more than doubled by boosting the size of the groups from 30 to 65 aircraft in each of the nine groups of the S.A.C. On top of this, procurement of the controversial B-36 is being stepped up, despite the recent blow-up in Congress as the result of Navy criticism. It is claimed that the Weapons Evaluation Board of the National Military Establishment, *after exhaustive study*, has now approved the big bomber and current plans call for a total of 216, of which probably about 80 have been delivered so far.

An interesting sidelight on this evaluation—or rather re-evaluation—of the Big Stick is furnished by another story

now in circulation to the effect that the U.S.A.F. is planning the installation of a pair of Republic F-84 Thunderjets under the wings of a B-36. If true, this revival of the "parasite" escort fighter is another surprising reversal of Air Force policy, especially in view of the abandonment of the earlier bomb-bay bug experiment with the specially-designed McDonnell XF-85 Goblin jet fighter. It would also seem to cast doubt on the ability of the B-36 to defend itself.

There were several inherent snags in the original parasite-bug project, some of which we have previously discussed in connection with the B-36. Subsequent development has brought to light at least four, namely:—(1) Although easy enough to launch off the hook, the Goblin lived up to its name and acted like a very mischievous sprite when the pilot attempted to re-engage with the trapeze; several near accidents occurred, followed by extremely "hot" landings on the belly skid. (2) Duration was extremely short (some 30 min), thus severely limiting combat effectiveness over enemy territory. (3) Stability and control were unsatisfactory due to the tumbling characteristics of the fat stubby body and cramped tail organs, as the result of the dimensional limitations imposed by the bomb-bay. (4) Any spare volume in the bomb-bay was required for extra fuel tankage in order to meet the original 10,000-mile range specification.

Judged purely on its merits as a protective escort, the well-tried F-84 is obviously a much sounder proposition than the experimental XF-85, especially on the score of range. But, speaking as a layman, this observer thinks that the scheme still looks highly impractical—much as if one expected the naval pilot to land on a carrier by engaging a trapeze arm suspended, say, from the island superstructure. Under nicely controlled experimental conditions, the retrieving operation can undoubtedly be performed, but under combat harassment (or foul weather) it must surely call for the superlative skill of the circus acrobat rather than the finale of a gruelling combat mission on the part of the jet fighter pilot.

Presumably, this new flea now biting the U.S.A.F. military planners is being considered as an alternative proposal to the supplementary jet podding of the B-36D version. (The jet pods, in effect, are now emerging from the chrysalis stage.) "Scratch a Russian and you'll find a Tartar," we were taught in our youth; to-morrow, according to American thinking, the Tartar may scratch a B-36 and find a couple of fleas in his ear.

MICE AND MEN

DEVELOPMENT of a folding-fin air-to-air rocket projectile, small enough to be carried in quantity by a mother aircraft, yet claimed as fast and powerful enough to destroy any known breed of aircraft with a direct hit, has been announced by the U.S. Navy Bureau of Ordnance. Nicknamed the "Mighty Mouse," the new rocket missile is 3 inches in diameter and has been specifically designed for use on modern, high-speed aircraft of the jet fighter and bomber type. It has been successfully test-fired from a Douglas AD Skyraider at the Naval Ordnance Test Station, Inyokern, California, where it was developed.

Navy officials say that the folding-fin principle has proved highly satisfactory in tests. The fins, which give directional stability to the rocket in flight, fold together while in the launching tube and immediately extend outward to their normal flight position on ejection. The rockets may be fired singly or in salvo from the launcher, the latter being a new type now under development by the Navy.

While hitherto the rocket-firing fighter has had the edge on the bomber in this particular branch of ballistics, in the near future we may expect to see the cross-wind launching of rocket missiles fired broadside from bomber turrets as a counter-weapon against the line-of-flight rocket attack of the fighter. Research is being conducted at Inyokern into cross-wind launching of rockets and considerable ground-work has already been done with the missiles fired broadside from a high-speed rail-car.

Collaboration tests are planned between the Navy and the Air Force and officers of the latter service are said to be so impressed with the results of Navy tests that they are considering the Mighty Mouse as the primary weapon on the North American F-86 Sabre and the new Lockheed F-94B all-weather two-seater fighter powered with the Pratt and Whitney J-48 (Rolls-Royce Tay). Such use, it is believed, would be as an interim weapon pending development of an air-to-air guided missile such as the new Ryan Firebird.

FARNBOROUGH PRIZE-GIVING

Sir Archibald Rowlands Presents Awards at R.A.E. Technical College

IN his opening speech at the prize-giving ceremony at the R.A.E. Technical College, Farnborough, on March 15th, Sir Frederick Handley Page, chairman of the newly constituted Board of Governors, emphasized the importance of technical education in life today. What was, however, of overriding importance was the attitude of mind in applying technical knowledge to the best advantage. Too much attention had been given in the past to the pure scientist, but it was the engineer who made the work of the scientist available for the common good.

The Principal of the College, Mr. R. D. Peggs, stated that the past year had been a period of consolidation rather than of expansion. The high academic standard which the College had set itself had been continued, and five of the 100 technical State scholarships had been granted to college students. Of particular merit among other successes were the scholarships, exhibitions and/or bursarships gained by five students to attend Cranfield, first place in all England, and bronze medal in the City and Guilds examination in aeronautical engineering practice, and a Whitworth Society prize.

Sir Archibald Rowlands, Permanent Secretary to the Ministry of Supply, in a speech preparatory to his distribution of the many prizes, told his audience that, although not a student of modern educational theory, he thought he understood what education meant. Essentially its purpose was to adjust the individual to his environment and to bring out all the latent virtues he possessed. A human being had a body and a mind, and Sir Archibald thought that on such an occasion, and to such an audience, it was not unfitting that he should stress the importance of a healthy body. He would not suggest that anyone should not work hard at his studies, but it was, nevertheless, important not to overtax strength, and the aim should be to preserve a balance in all things. A one-sided or lop-sided focus of interest should be guarded against and, in short, it was more important to acquire the art of living than the means of living. Primarily, the aim of science was to provide more leisure in life and if, instead, science destroyed leisure, it would become a scourge. Finally, Sir Archibald advised his hearers always to adopt a critical attitude toward opinion, even to the extent of questioning the statements of the tutorial staff.

AIR SURVEY

CURRENT techniques of air survey and mapping were reviewed by Professor C. A. Hart, D.Sc., Ph.D., M.I.C.E., F.R.I.C.S., in a paper given before the Royal Aeronautical Society last Thursday, March 16th.

The lecturer began by citing the basic problems of operation, among which were those of minimizing camera-tilt and, of course, of accurate navigation. He showed how, in the latter case, the use of radar systems and of phase-differentiated c.w. radio (as in the Decca Navigator) had brought about something of a revolution in the science.

Altimetry still presented a major problem, for the surveyor required altitudes above mean sea level, and for this he had so far had to rely on barometric altimetry. The Airborne Profile Recorder—the radar system recently developed in Canada—had great possibilities.

After exemplifying recent developments in the photogrammetric mapping, and mapping by remote control, the lecturer went on to describe what he referred to as the new geodesy, i.e., radar-range measurement of long lines obtained by flying an aircraft a number of times across the base between two radar stations. We hope, in our next issue, to give a more detailed summary of Professor Hart's lecture.

CORRESPONDENCE

The Editor of "Flight" does not hold himself responsible for the views expressed by correspondents in these columns. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

Time for Training

WHILE I entirely agree with almost everything that ex-S/L. Phillip R. Goodwin says in his letter (March 16th), I believe that in remarking that he is unable to spare the time to join the Reserve, he is probably depending upon printed pamphlets for his information rather than investigating the facts by a visit to a V.R. airfield or talks to active V.R. pilots.

I would suggest that if he is keen to fly he goes into this matter carefully, for from personal experience I can say that the authorities are most understanding and co-operative. Presumably the fifteen days' continuous training is the most difficult requirement, but arrangements can now be made to divide it up, or even waive a part of it, to suit individual requirements. Incidentally, I believe a scheme is now coming into action which will permit attachments to regular squadrons for "camp" for those who can give the full time.

So far as regular attendance is concerned, the requirements are nothing like as difficult as those of the Auxiliary Air Force, of which so many of us would like to be flying members. If a great deal of a man's time is occupied, a very occasional week-end of flying with the V.R. is sufficient, and the worst that happens is that he will receive only a proportion of his £35 tax-free gratuity instead of the lot, because he has not completed the minimum qualifying hours.

FLIGHT LIEUTENANT, R.A.F.V.R. (second tour).

London, S.W.14.

Backs to the Engines?

IT would be interesting to see the official hedging which must now be going on to disprove that backward-facing seats would save lives in crashes. Rather than attempt to prove such prejudice wrong, let us, instead, take a standard case of an aircraft crash with forward-facing seats and see what happens.

Given sufficient impact (which is not difficult to obtain, in these days of high landing-speeds) the occupant of a forward-facing seat will, if wearing the usual type of strap provided for passengers, either: (1) Break his (or her) neck; (2) be flung over his strap; (3) be flung under his strap; (4) crush his skull in, on something ahead, if the seat anchorage gives.

What happens with a backward-facing seat? In this case, the lap strap is sufficient to keep the passenger securely held and, if the seat *does* come adrift, the back of the seat head-rest protects the passenger's head from the initial impacts at least—and the initial impacts are the worst.

Incidentally, wire "preventer" stays, from the underneath of seats to the floor, *designed to withstand fore-and-aft shocks*, would help prevent telescoping, and the seats themselves could be designed to protect the occupants from injury even if telescoping takes place. (I won't insult the intelligence of designers by suggesting how.)

If the above does not convince our planners that backward seats are best, why is it that they are fitted in the King's aircraft?

Of course, if we like to tackle the problem of air safety from the beginning, the first requirement is to insist upon a slow landing speed of no more than 60 m.p.h. *whatever* the penalty in reduced flying speed when cruising.

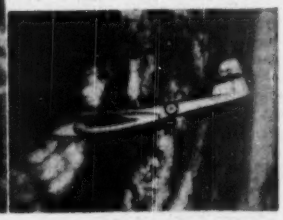
Would any sane man agree to sit in a charabanc or omnibus while it is dropped on a runway from anything between one to four feet up at a speed of 140 miles per hour or so? Yet that is what, in effect, our airlines of to-day require of their passengers.

Incidentally, while on the subject of air safety, it seems odd that it is not within the capability of man to devise an aircraft which, in the event of danger or necessity, could rid itself of those parts of which retention is a liability and not an asset—to wit, petrol tanks, dead weight, etc. Could not something be learned from the Mayo composite aircraft, and passenger aircraft be constructed in two sections, with the petrol tanks and cargo in the lower, jettisonable half, to which the engines could be affixed on short wing stubs, thus leaving the top half in the form of a detachable glider? DENIS HORNSEY.

East Twickenham, Middlesex.

[F/L. Hornsey, D.F.C., tells us that he was formerly Research and Development, Equipment (Bombers) representative on the M.A.P. Emergency Escape Committee. He has 1,600 hours' Service flying experience.—ED.]

One of the two Meteor pictures. Left: as it was; right: as Mr. Lynch suggests it should have been.



Which Way Up?

ALTHOUGH in your editorial comments you praise the Gloster photographer for his skill in securing the two Meteor pictures reproduced on p. 313 of *Flight* for March 9th, you have done him less than justice by printing them with the ground as a base. Both need turning so that the aircraft are seen from correct perspective. The first then comes round on to its right-hand edge and gives a much more vivid impression of hurtling earthwards. The other needs turning upside down and then leaves a landlubber like myself with the alarming feeling that if one dropped out of that particular machine one would plunge into high heaven.

Hillingdon, Middlesex. WILL LYNCH, A.R.P.S.

[This is always a debatable matter. In the past, on occasions, we have done what our correspondent suggests—and been criticized for it.—ED.]

g-Plus

THE official pamphlet for the Meteor 7 states that "the occupant of the rear cockpit suffers higher *g* loads during aerobatics than the pilot in the front cockpit."

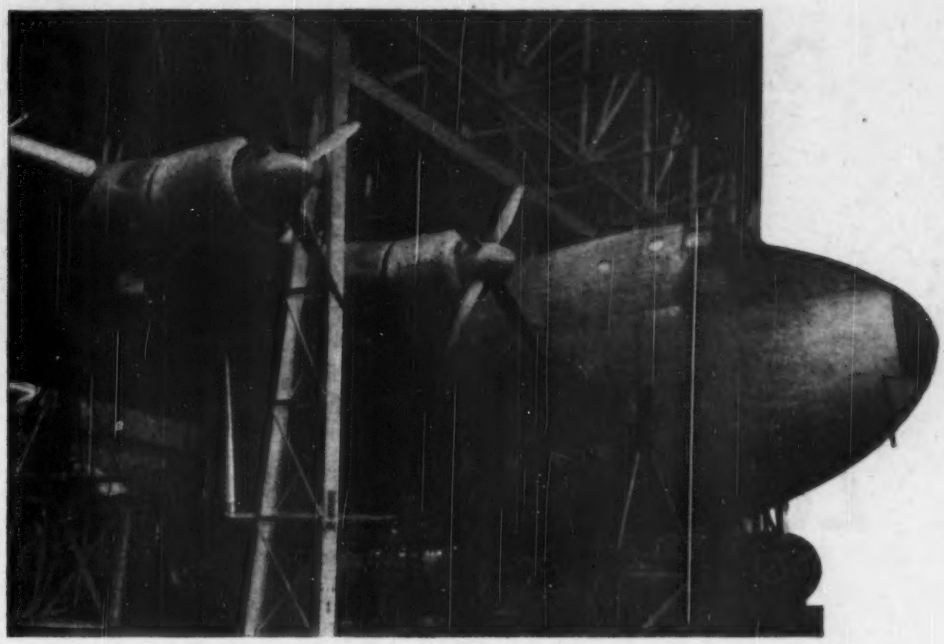
Surely the amount of *g* suffered is variable by two factors only, the diameter of the loop being performed and the speed of the aircraft. The diameter of the circle is obviously within an inch or so for the two occupants, and their speed is the same. It is, of course, possible that the *effect* of *g* is greater owing to the angle of the body, legs, etc., but the pamphlet states that the actual "load" is greater.

Perhaps your readers can solve this one.

New Malden, Surrey. K. N. HASELWOOD.

FORTHCOMING EVENTS

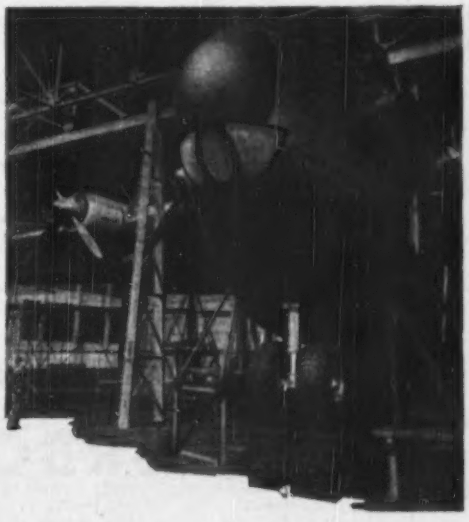
March	23.	R.Ae.S. (Glasgow): "Fuel Consumption," by J. Leggatt.
March	23.	R.Ae.S. (Isle of Wight): "Gliding," by P. A. Wills, C.B.E.
March	24.	College of Aeronautics Senior Common Room Society: Annual Dinner.
March	24.	Aircraft Golfing Society: Annual Dinner.
March	25.	Helicopter Association: "Performance Testing of Helicopters," by F. O'Hara, M.A.
March	27.	R.Ae.S. (Bristol): "Gliding," by A. H. Yates, B.Sc., A.F.R.Ae.S.
March	28.	Institute of Transport (Metropolitan Graduates): "Post-war R.A.F. Developments and their Effects on Civil Aviation," by A. J. Affum.
March	28.	R.Ae.S. Graduates: "Undercarriage Design and Testing," by G. S. Cranwell, Grad. R.Ae.S.
Mar. 28-31		Royal Meteorological Society: Symposium, Oxford.
March	29	R.Ae.S. (Gloucester and Cheltenham) "Aircraft Materials and Processing," by Dr. H. Sutton, D.Sc., F.R.Ae.S., F.I.M. (at Gloucester).
March	30	R.Ae.S.: "Testing Aero Engines and Power Plants," by A. C. Lovesey, O.B.E., B.Sc., F.R.Ae.S.
April	1	British Interplanetary Society: "Space Travel—Facts and Fiction," by A. C. Clarke, B.Sc.
April	1	Aircraft Golfing Society: Captain's Prize Laleham G.C.
April	3	Institute of Transport: Brancker Memorial Lecture—A.V.-M. D. C. T. Bennett, C.B., C.B.E., D.S.O.
April	3.	R.Ae.S. (Derby): "Testing Engines and Power Plants," by A. C. Lovesey, O.B.E., B.Sc., F.R.Ae.S.
April	4.	R.Ae.C.: Film Show, Londonderry House.
April	4.	R.Ae.S. (Belfast): Annual General Meeting.
April	5.	R.A.F. Golfing Society: Match v. Greyhound Racing Association.
April	5.	R.Ae.S. (Bristol): "Aircraft Production and Engineering," by Prof. J. V. Connolly, B.E., A.F.R.Ae.S.



On the 'Blackburn' Universal Freighter

This important aircraft, to Air Ministry Specification C3/45, incorporates some very interesting Lockheed equipment. The fixed tricycle undercarriage is of Lockheed design and manufacture and the main struts are designed for an all-up weight of 95,000 lb, with a vertical rate of descent of 12 f.p.s., and are each 13' 8" in length.

The self-centering nose wheels are Lockheed hydraulically power steered, controlled from duplicate foot pedals: while power for the flying control units is provided by the normal Lockheed system, which incorporates two Lockheed Mk' VI Hydraulic pumps. An important feature of this aircraft is in the manually powered Lockheed hydraulic system for operating the loading ramp and its fairing doors. These doors are sequenced with the ramp to open before, and close after, the ramp operation and locking are completed. The ramp jacks are of such a construction that variations of oleo compression, due to varying loads, still allow the ramp to maintain contact with the ground, the jacks eventually becoming hydraulic struts capable of supporting a load of 45,000 lb. The ramp, therefore, becomes a fourth reaction point additional to the three legs.



ALL-BRITISH Lockheed

REGD. TRADE MARK

AUTOMOTIVE PRODUCTS COMPANY LTD., LEAMINGTON SPA

De HAVILLAND COMET

WORLD'S FASTEST AIRLINER

FLIES

LONDON—ROME

IN UNDER

*2 HOURS

FUELLED IN BOTH CAPITALS

WITH

AVIATION TURBO FUEL

*(Subject to official confirmation)

REHEARSAL: The Avro Canada CF-100 all-weather fighter (two Rolls-Royce Avon) is seen prior to being demonstrated by S/L. Waterton before H.R.H. Prince Bernhardt of the Netherlands, the Governor-General of Canada and the Canadian Prime Minister.

SERVICE AVIATION

Royal Air Force and Naval Aviation News and Announcements

For Service in Malaya

THE KING has been graciously pleased to approve the following appointments and awards for distinguished service in Malaya during the period June 1st to November 30th, 1949. Extracts from citations appear in each case.

C.B.E.

G/C. H. J. Butler the Officer Commanding the Equipment Wing, Seletar, has made a most valuable contribution to the conduct of air operations in Malaya.

O.B.E.

S/L. J. I. C. Dent, serving at Advanced Air Headquarters, Malaya, as Intelligence Officer has worked untiringly to produce intelligence appreciations, statistics and summaries.

S/L. J. H. Steer, as Officer Commanding the Aircraft Repair Squadron, Seletar, has at all times successfully maintained or exceeded the planned flow of aircraft to the front line.

M.B.E.

F/L. C. W. White has been Station Armament Officer at Kuala Lumpur for eight months during the Malayan emergency. He and his very small staff have worked cheerfully and efficiently to prepare aircraft for anti-bandit operations.

F/O. T. B. Walker is in charge of the Danger Area of the Explosives Site at the Maintenance Base (F.E.), Seletar. He has shown enthusiasm and untiring efforts.

W/O. G. H. Reeves, R.A.F. Maintenance Base (F.E.), Seletar, is in charge of the Central Drafting Office. His efforts to increase the output from the Base, upon which the successful prosecution of air operations largely depends, have been most valuable.

Bar to D.S.O.

S/L. E. D. Crew, D.S.O., D.F.C., has flown 250 hours on Malayan operations. During the operations in Malaya in 1948-49, as Officer Commanding No. 45 Squadron, he personally led over 100 strikes against bandit camps and hideouts and also flew 20 sorties on convoy escort, reconnaissance, etc. His determined and gallant leadership has been an inspiration to his squadron, and the magnificent results which have been achieved can be largely attributed to the fine example he has set.

D.F.M.

Plt. H A. D. Cordiner has served with No. 60 Squadron since December, 1948; he has flown 95 hours on Malayan operations and has taken part in 63 strikes against the Communist insurgents. He has led numerous sorties and has always pin-pointed and attacked targets with great accuracy and determination.

B.E.M.

F/S. R. G. Garthwaite is N.C.O. i/c of the Daily Servicing Section of No. 48 Squadron, which has been employed in support of Army Operations in Malaya. He has worked unceasingly and under difficult and exacting conditions to maintain and improve the serviceability of the squadron aircraft.

F/S. R. F. A. Holdaway has been in charge of daily servicing in No. 45 Squadron since May, 1949. He has always displayed outstanding keenness, initiative and drive in the execution of his duties.

Sgt. W. T. Keable was posted to Kuala Lumpur as N.C.O. i/c. Equipment Section in November, 1948. By his personal efforts he has succeeded not only in keeping the aircraft of the squadron in a serviceable condition, but also in improving the living conditions on the Station.

Mention in Despatches

THE following have been mentioned in despatches for distinguished service in Malaya during the same period:—

W/C. R. K. Cassells, D.F.C., A.F.C.; W/C. F. P. Cotterell, O.B.E.; W/C. L. D. Dadswell, B.Sc.(Eng.); S/L. R. R. Chapman; S/L. R. C. Drury, M.M.; S/L. J. R. St. John, D.S.O., D.F.C.; F/L. W. B. Begy; F/L. K. W. Dalton-Golding; F/L. J. M. McCann; F/L. W. McClymont; F/L. G. E. Mott, D.F.C.; W/O. W. J. Flynn; W/O. J. Holding; W/O. D. H. W. Prescott; F/S. W. H. Tebby; Sgt. C. J. Brown; Sgt. J. Cairns; Sgt. A. Calvert; Sgt. H. Farrow; Sgt. J. MacDonald; Plt. Il G. R. Watson; Nav. Il A. D. T. Prevost; Sig. Il J. L. Monaghan; Cpl. A. L. bin Ahmed Shah; Cpl. E. Brown; Cpl. A. Douglas; Cpl. W. A. S. Fricker; Cpl. J. A. Gibbens; Cpl. H. S. Stein; Cpl. D. D. Vincent; L.A/C. J. R. Austin; A/C.1 E. A. C. Lane.

600 Squadron Memorial

HER MAJESTY THE QUEEN, who is the Honorary Air Commodore of No. 600 (City of London) Squadron, R.Aux.A.F., will unveil a memorial to deceased members of the Squadron at a service on July 26th. The service, which marks the silver jubilee of 600 Squadron, is to be held at the Church of St. Bartholomew the Great. During the ceremony, an R.A.F. ensign will be dedicated by the Bishop of London.

Donations towards the memorial will be gratefully received by the Secretary, Memorial Committee, No. 600 (City of London) Squadron, Finsbury Barracks, E.C.1. As accommodation will be limited, the secretary is also dealing with applications for seats from relatives and friends of Squadron members who died between 1925-50.

German Relief Scheme Ends

THE R.A.F. German Refugee Relief Scheme, started in B.A.F.O. in the summer of 1948, has now been wound-up. The object of the scheme was to assist homeless and destitute Germans reaching the British Zone of Germany from the East. Staffed by voluntary helpers, mainly the wives of R.A.F. officers, the scheme has helped over 21,000 refugees. More than £1,400 was raised to buy blankets, and 2,000 sacks of clothing were collected, washed, repaired and distributed.

The scheme was originated by Ladv

SERVICE AVIATION . . .

Sanders, whose husband, Air Marshal Sir Arthur Sanders, then commanded B.A.F.O., and the organization in Germany was subsequently taken over by Mrs. Williams, wife of Air Marshal T. M. Williams, the present Commander-in-Chief. A London committee was formed by Lady Tedder, wife of the former Chief of the Air Staff.

Trouble for Terrorists

AVRO Lincoln bombers of No. 57 Squadron, hitherto based at Waddington, Lincs, left on March 15th for Singapore, to intensify the air assault on the bandits in Malaya. They were to fly in stages of about 2,000 miles a day. Ground crews were lifted separately in Yorks and Hastings. It is understood that No. 57 Squadron will be stationed in Malaya indefinitely.

Memorial Prize Revived

THE Hyde-Thomson Memorial Prize, suspended on account of the war in 1939, is to be reintroduced under revised conditions. The Prize was founded in 1918 by Mr. R. H. Hyde-Thomson in memory of his son, the late Lt.-Col. Douglas Hyde-Thomson, for the promotion of R.A.F. proficiency in wireless telegraphy and kindred subjects.

The net annual income of the fund, at present about £72, will be used to provide cash awards for aircraft apprentices of No. 1 Radio School, Cranwell. Half the income will be equally divided to provide a cash award at each passing-out from the school to the aircraft apprentice who passes out with the highest marks in radio subjects and is accepted for a General Duties cadetship at the R.A.F. College. The other half will be awarded each year to the aircraft apprentice who passes out from the school with the highest marks in radio subjects in that year and who is accepted for a course at a university as a Technical Branch cadet. The awards will be made by the Air Council in consultation with the Officer Commanding No. 1 Radio School.

No. 2600 SQUADRON, R. AUX. A.F. REGT., recently received the Hawker Siddeley Efficiency Cup for unit competition, donated by Sir Frank Spencer Spriggs, managing director of the Hawker Siddeley Group. S/L. M.N. Golovine (right) made the presentation to the C.O., S/L. A. G. Collings. On the left is Brigadier M.A. James.

Oldest Transport Squadron

WING COMMANDER C. F. READ, D.F.C., Royal Australian Air Force, has been appointed Officer Commanding No. 24 (Commonwealth) Squadron, Transport Command, in succession to W/C. P. A. Lombard, D.F.C., R.A.F., who is about to take up a staff appointment at Air Headquarters, Hong Kong. No. 24 Squadron, equipped with Yorks and Dakotas and based at Oakington, Cambridge, is engaged on special flights and the carriage of V.I.P.s.

A fighter unit in the first world war, the Squadron was reformed in February, 1920, for communications duties. It was thus the first permanent transport squadron in the R.A.F., and has now completed 30 unbroken years in this capacity. During the early years its aircraft were current operational types of open-cockpit biplanes, with guns and other equipment removed from the rear seats. During the 1939-45 war, one of the Squadron's notable achievements was the completion of more than 300 shuttle flights, in unarmed Hudsons, carrying vital supplies to the beleaguered island of Malta. The King and Queen have flown with 24 Squadron, and Princess Elizabeth made her first flight in one of its Dakotas.

In 1947 the unit was reorganized to include representation from the Australian, New Zealand and South African Air Forces, the Dominion aircrews serving with the R.A.F. on an exchange basis. The post of squadron commander is filled by each of these Dominions Air Forces and the R.A.F. in turn. The new C.O. joined the R.A.A.F. in 1937.

Hornchurch History

THE Station Commander, R.A.F., Hornchurch, G/C. F. C. Sturgis, O.B.E., is anxious that a history of this very old station be compiled. F/O. B. R. Clarke, a Reservist, who has just completed a history of Atlantic flying, has undertaken the work and asks readers to forward to him—at 86 Reserve Centre, R.A.F., Hornchurch, Essex—any information, anecdotes or photographs of Hornchurch in the past.

Reunions

NO. 287 Squadron reunion.—Chandos Restaurant, Trafalgar Square, on Saturday, April 22nd, at 6 p.m. All past members and their partners are invited. Details from Ron Grose, 14-18, Station Buildings, New Bridge Street, London, E.C.4.

• • •

No. 267 Squadron.—On Saturday, June 3rd, at Chez Auguste Restaurant, 47, Frith Street, London, W.1. Tickets (9s) from Ronald Bramer, 6, Fair Oaks Place, Chobham, near Woking, Surrey.

"Flight" photograph.

GOLF OCCASION: On Tuesday of last week the annual match between the Aero Golfing Society and the R.A.F. Golfing Society for the Keith Davies cup was held at the Royal Wimbledon course. The R.A.F. won by 9½ to 2½. In the same evening the directors of *Flight* entertained both teams to dinner at Londonderry House. In the above group, taken at Wimbledon, are (back row): G/C. G. F. Macpherson, G/C. K. A. Jackman, K. Silcock, Lord Brabazon, W. Metcalfe, G/C. C. S. Morice, W/C. W. Beringer and G/C. A. Ryde; (front row): G/C. P. W. S. Bulman, S/L. J. Morgan, W/C. Ingram and W/C. L. R. Mumby.

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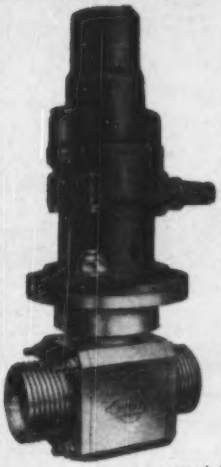

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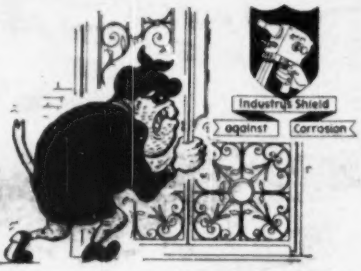

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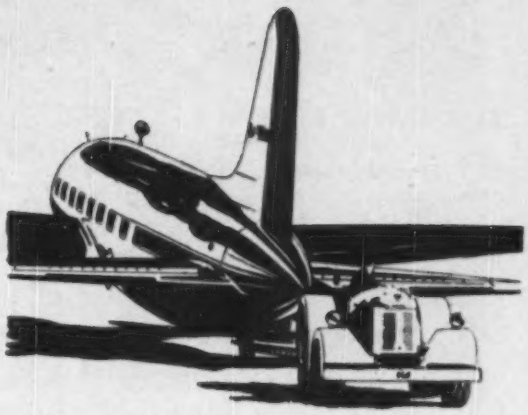

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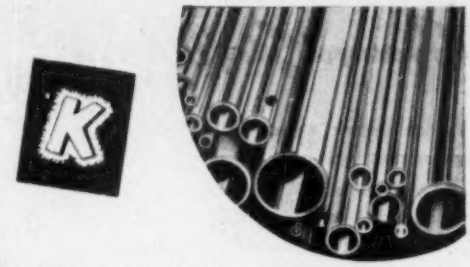

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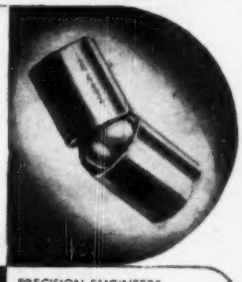

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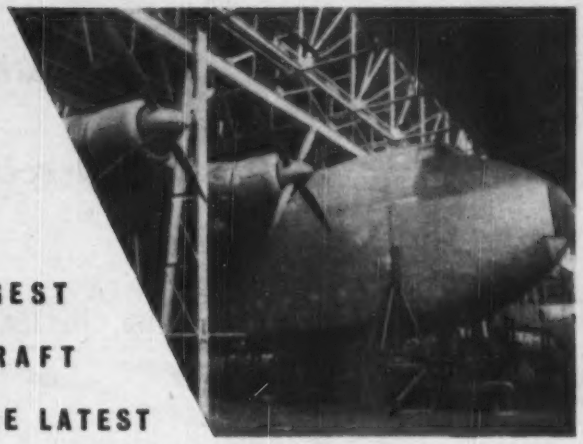

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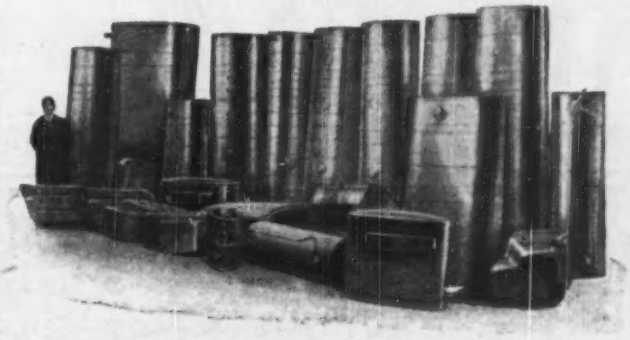

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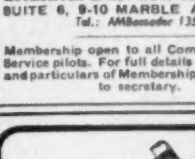

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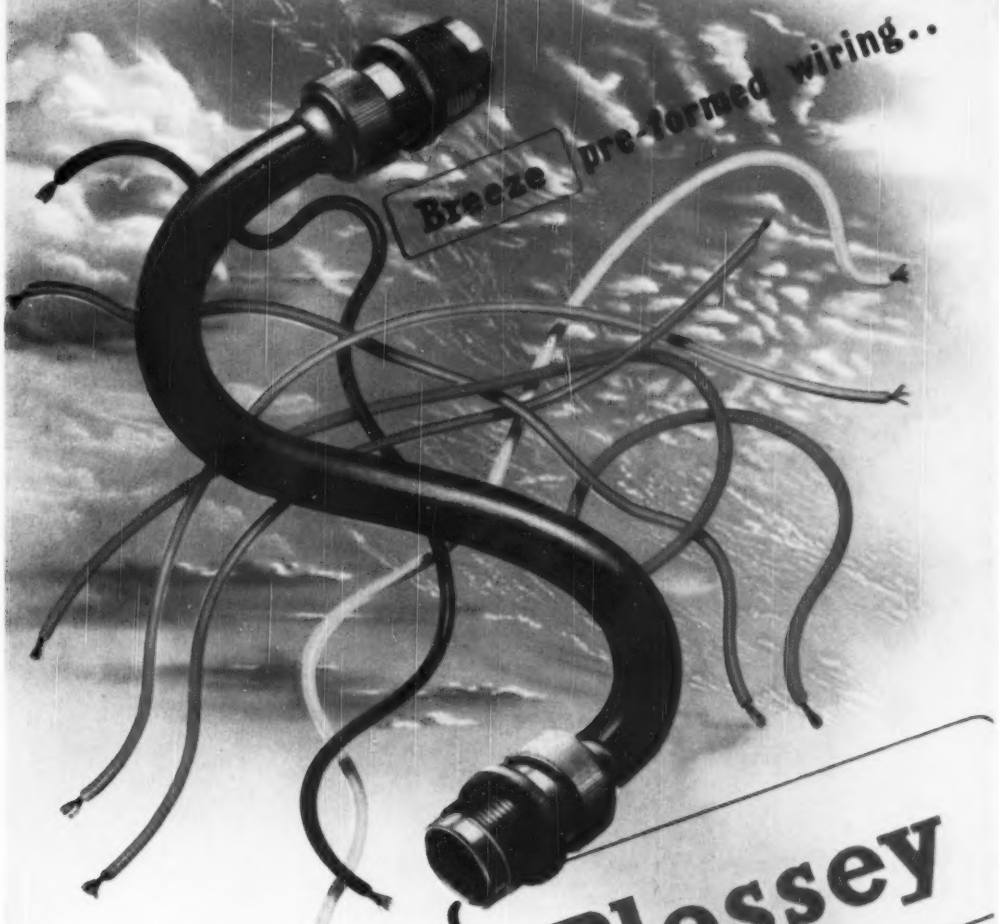

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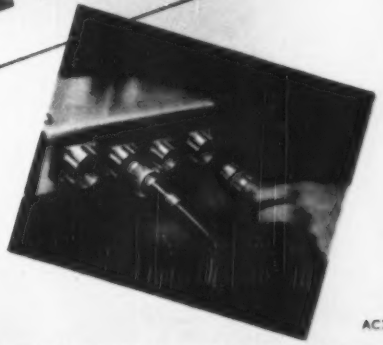

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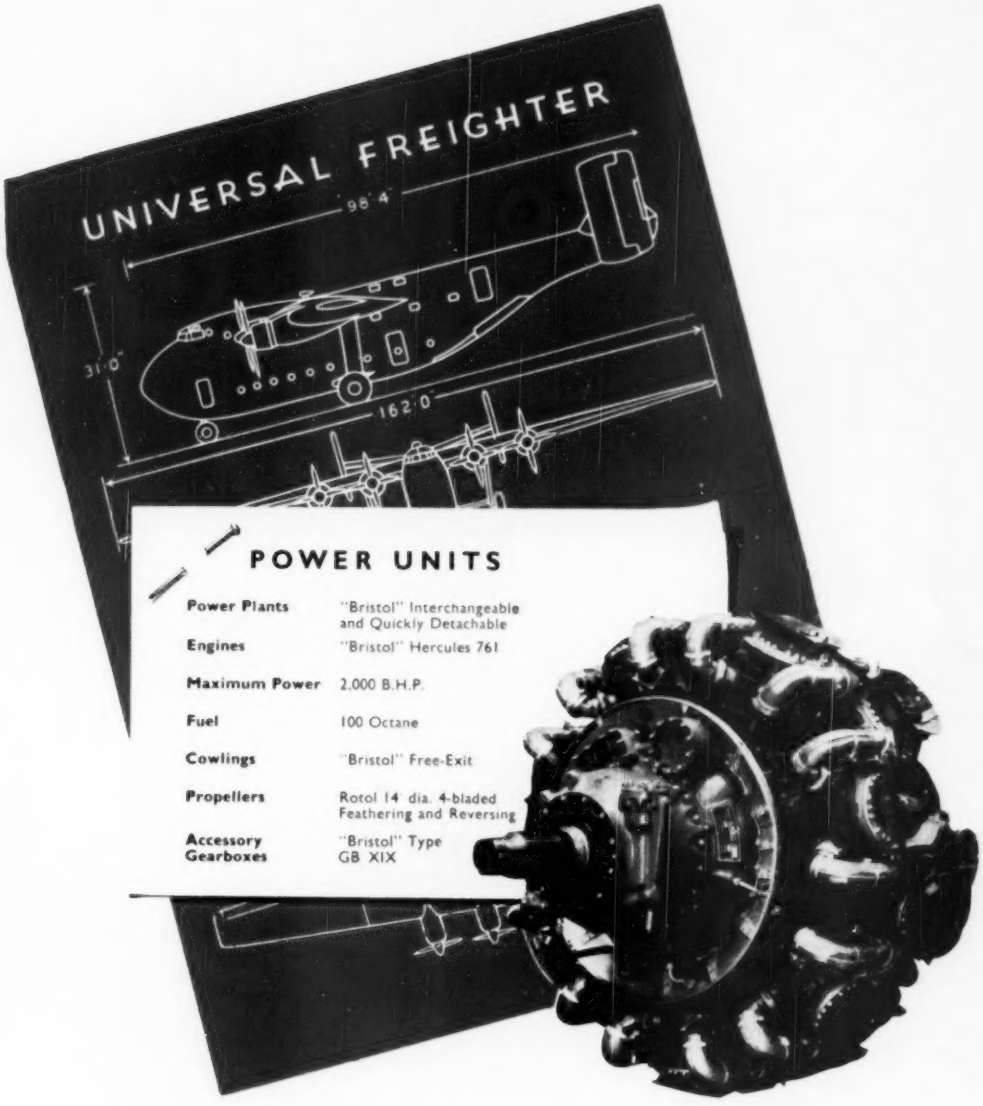

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